S

ENGINEERING CHANGE NOTICE	1. ECN 643814
Page 1 of 2	Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental [] Direct Revision [X] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	Jim G. Field, Data Assessment and Interpretation, R2-12, 376-3756	[] Yes [X] No	07/30/98
	6. Project Title/No./Work Order No. Tank 241-AX-101	7. Bldg./Sys./Fac. No. 241-AX-101	8. Approval Designator N/A
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12a. Modification Work	12b. Work Package No.	12c. Modification Work Complete	12d. Restored to Original Condition (Temp. or Standby ECN only)
[] Yes (fill out Blk. 12b) [X] No (NA Blks. 12b, 12c, 12d)	N/A	N/A Design Authority/Cog. Engineer Signature & Date	N/A Design Authority/Cog. Engineer Signature & Date

13a. Description of Change   13b. Design Baseline Document? [] Yes [X] No

The document has been totally revised to include the results of recent sampling to address technical issues associated with the waste, and to update the best basis standard inventory.

14a. Justification (mark one)

Criteria Change	[X]	Design Improvement	[]	Environmental	[]	Facility Deactivation	[]
As-Found	[]	Facilitate Const	[]	Const. Error/Omission	[]	Design Error/Omission	[]

14b. Justification Details

Changes required to incorporate new sampling data.

15. Distribution (include name, MSIN, and no. of copies)

See attached distribution.

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ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1)
ECN-643814

16. Design Verification Required	17. Cost Impact				18. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[] Yes	Additional	[] $	Additional	[] $	Improvement	[]
[X] No	Savings	[] $	Savings	[] $	Delay	[]

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[]	Operating Procedure	[]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]	Tickler File	[]
Environmental Report	[]	Inspection Plan	[]		[]
Environmental Permit	[]	Inventory Adjustment Request	[]		[]

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
N/A		

21. Approvals

	Signature	Date		Signature	Date
Design Authority			Design Agent		
Cog. Eng. J.G. Field	JG Field	8/20/98	PE		
Cog. Mgr. K.M. Hall	Kathleen M. Hall	8/20/98	QA		
QA			Safety		
Safety			Design		
Environ.			Environ.		
Other J.W. Cammann	JW Cammann	8/20/98	Other		
R.J. Cash	RD Johnson for RJC	8/20/98	DEPARTMENT OF ENERGY		
J.G. Kristofzski	NW Kirch for JG Kristofzski	8/24/98	Signature or a Control Number that tracks the Approval Signature		
			ADDITIONAL		

S

Tank Characterization Report for Single-Shell Tank 241-AX-101

Jim G. Field
Lockheed Martin Hanford Corp., Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-87RL10930

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Abstract: This document summarizes the information on the historical uses, present status, and the sampling and analysis results of waste stored in Tank 241-AX-101. This report supports the requirements of the Tri-Party Agreement Milestone M-44-15B.

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Tank Characterization Report for Single-Shell Tank 241-AX-101

J. G. Field
S. R. Wilmarth
Lockheed Martin Hanford Corp.

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LIST OF TERMS

ANOVA	analysis of variance
Btu/hr	British thermal units per hour
Ci	curie
Ci/g	curies per gram
Ci/L	curies per liter
CI	confidence interval
cm	centimeter
DQO	data quality objective
DSC	differential scanning calorimetry
ft	feet
g	gram
g/cm^3	grams per cubic centimeter
g/L	grams per liter
g/mL	grams per milliliter
HDW	Hanford defined waste
HHF	hydrostatic head fluid
IC	ion chromatography
ICP	inductively coupled plasma spectroscopy
in.	inch
J/g	joules per gram
kg	kilogram
kgal	kilogallon
kL	kiloliter
kW	kilowatt
L	liter
LFL	lower flammability limit
LL	lower limit
m	meter
m^2	square meters
M	moles per liter
mg/m^3	milligrams per cubic centimeter
mL	milliliter
mm	millimeter
mol%	mole percent
n/a	not applicable
n/r	not reported
PHMC	Project Hanford Management Contractor
ppm	parts per million
ppmv	parts per million volume
PUREX	Plutonium Uranium Extraction (Facility)
QC	quality control

LIST OF TERMS (Continued)

RGS	retained gas sample
RPD	relative percent difference
SMM	supernatant mixing model
SMMA1	saltcake waste generated from the 242-A Evaporator
SRR	strontium recovery waste
TCR	tank characterization report
TGA	thermogravimetric analysis
TIC	total inorganic carbon
TLM	tank layer model
TOC	total organic carbon
TWRS	Tank Waste Remediation System
UL	upper limit
vol%	volume percent
wt%	weight percent
%	percent
°C	degrees Celsius
°F	degrees Fahrenheit
μCi/g	microcuries per gram
μCi/L	microcuries per liter
μCi/mL	microcuries per milliliter
μeq/g	microequivalents per gram
μg	microgram
μg/g	micrograms per gram
μg/mL	micrograms per milliliter
μm	micrometer
μmol	micromole

1.0 INTRODUCTION

A major function of the Tank Waste Remediation System (TWRS) is to characterize waste in support of waste management and disposal activities at the Hanford Site. Analytical data from sampling and analysis and other available information about a tank are compiled and maintained in a tank characterization report (TCR). This report and its appendices serve as the TCR for single-shell tank 241-AX-101. The objectives of this report are 1) to use characterization data in response to technical issues associated with tank 241-AX-101 waste and 2) to provide a standard characterization of this waste in terms of a best-basis inventory estimate. Section 2.0 summarizes the response to technical issues, Section 3.0 shows the best-basis inventory estimate, and Section 4.0 makes recommendations about the safety status of the tank and additional sampling needs. The appendices contain supporting data and information. This report supports the requirements of the *Hanford Federal Facility Agreement and Consent Order* (Ecology et al. 1997), Milestone M-44-15b, change request M-44-97-03 to "issue characterization deliverables consistent with the Waste Information Requirements Documents developed for 1998."

1.1 SCOPE

The characterization information in this report originated from sample analyses and known historical sources. The results of recent sample events will be used to fulfill the requirements of the data quality objectives (DQOs) and memoranda of understanding specified in Brown et al. (1997) for this tank. Other information can be used to support conclusions derived from these results. Appendix A contains historical information for tank 241-AX-101 including surveillance information, records pertaining to waste transfers and tank operations, and expected tank contents derived from a process knowledge model. Appendix B summarizes recent sampling events (see Table 1-1), sample data obtained before 1989, and sampling results. Appendix C provides the statistical analysis and numerical manipulation of data used in issue resolution. Appendix D contains the evaluation to establish the best basis for the inventory estimate and the statistical analysis performed for this evaluation. Appendix E is a bibliography that resulted from an in-depth literature search of all known information sources applicable to tank 241-AX-101 and its respective waste types. The reports listed in Appendix E are available in the Tank Characterization and Safety Resource Center.

Table 1-1. Summary of Recent Sampling.

Sample/date[1]	Phase	Location	Segmentation	% Recovery
Vapor sample (6/15/95)	Gas	Tank headspace, riser 9F, 7.3 m (24 ft) below top of riser	n/a	n/a
Grab (7/29/97)	Solid/ liquid	Riser 5B	Supernatant/ solids	n/a
Core 226 (1/8/98 to 1/16/98)	Solid/ liquid	15 segments, riser 9D	Upper and lower half	93 to 100%, except segment 1 (61%)
Core 228 (2/3/98 to 2/13/98)	Solid/ liquid	15 segments, riser 9G	Upper and lower half	87 to 100%, except segment 7 (37%)

Notes:

n/a = not applicable

[1]Dates are provided in the mm/dd/yy format.

1.2 TANK BACKGROUND

Tank 241-AX-101 is located in the 200 East Area AX Tank Farm on the Hanford Site. The tank went into service in 1965. Tank 241-AX-101 received fission product waste and organic wash waste from the Plutonium Uranium Extraction (PUREX) facility from the first quarter of 1965 until the last quarter of 1967. The tank also received PUREX waste from the second quarter of 1967 until the second quarter of 1968 and PUREX low-level waste from the second quarter of 1968 to the second quarter of 1969. High-level waste from B Plant was sent to tank 241-AX-101 from the first quarter of 1968 to the first quarter of 1973. From the third quarter of 1975 until the first quarter of 1976, tank 241-AX-101 was sluiced for strontium and cesium recovery. From the third quarter of 1975 until the second quarter of 1976, the tank received strontium recovery waste. It received double-shell slurry feed from the 242-A Evaporator from the fourth quarter of 1976 until the first quarter of 1977. Tank 241-AX-101 is sound and was labeled inactive in November 1980. It is passively ventilated. Partial isolation was completed in December 1982 (Brevick et al. 1997).

Table 1-2 is an overall description of tank 241-AX-101. The tank has an operating capacity of 3,785 kL (1,000 kgal) and contains an estimated 2,830 kL (748 kgal) of double-shell slurry feed waste (Hanlon 1998). The tank waste is made up of two distinct layers: a lower convective layer described as a salt slurry and an upper nonconvective layer described as a moist salt. The nonconvective layer was found to contain trapped gas. A detailed analysis of these layers is presented in this TCR. The tank is on the Watch List for flammable gas (Public Law 101-510).

Table 1-2. Description of Tank 241-AX-101. (2 sheets)

TANK DESCRIPTION	
Type	Single-shell
Constructed	1963-1964
In service	1965
Diameter	22.9 m (75 ft)
Operating depth	9.9 m (32.5 ft)
Capacity	3,785 kL (1,000 kgal)
Bottom shape	Flat
Ventilation	Passive
TANK STATUS	
Waste classification	Double-shell slurry feed
Total waste volume[1]	2,830 kL (748 kgal)
Supernatant volume	0 kL (0 kgal)
Saltcake volume[2]	1,359 kL (359 kgal)
Sludge volume[2]	11 kL (3 kgal)
Drainable interstitial liquid and free liquid[3]	2,142 kL (566 kgal)
Waste surface level (3/31/98)[4]	705 cm (277.6 in.)
Temperature (3/31/1997 to 3/31/1998)	24.2°C (75.5°F) to 55.8°C (132.5°F)
Integrity	Sound
Watch List	Flammable gas
Flammable gas facility group	3
SAMPLING DATE	
Vapor sample	June 1995
Grab sample	July 1997
Push core sample	January/February 1998

Table 1-2. Description of Tank 241-AX-101. (2 sheets)

SERVICE STATUS	
Declared inactive	1980
Interim stabilization	Not completed

Notes:

[1]The waste volume is estimated from surface level measurements.

[2]The volume differs from Hanlon (1998). It does not include free liquid volume.

[3]The volume differs from Hanlon (1998). It includes 386 kgal of free liquid, included by Hanlon as part of the saltcake layer, and it assumes the drainable porosity of the saltcake is 50 volume percent (see Appendix D).

[4]The equivalent surface level measurement is 763 kgal. The surface level measurement is 5.6 in. high because of a high spot on the tank surface where measurements are taken (Swaney 1993).

2.0 RESPONSE TO TECHNICAL ISSUES

The following technical issues have been identified for tank 241-AX-101 (Brown et al. 1997).

- **Safety screening**: Does the waste pose or contribute to any recognized potential safety problems?

- **Flammable gas**: Does a possibility exist for releasing flammable gases into the headspace of the tank or releasing chemical or radioactive materials into the environment?

- **Organic complexants**: Does the possibility exist for a point source ignition in the waste followed by a propagation of the reaction in the solid/liquid phase of the waste?

- **Organic solvents**: Does an organic solvent pool exist that may cause a fire or ignition of organic solvents in entrained waste solids?

- **Historical model**: Does the waste inventory generated by a model based on process knowledge and historical information (Agnew et al. 1997) represent the current tank waste inventory?

- **Compatibility**: Will safety problems be created as a result of commingling wastes in interim storage? Do operations issues exist which should be addressed before waste is transferred?

Data from the analysis of push core samples (Esch 1998), tank headspace measurements, and available historical information provided the means to address the safety screening, flammable gas, and historical issues. Data from the June 1995 vapor sample were used to address the organic solvents issues, and data from the July 1997 grab sample were used to assess tank compatibility issues. See Appendix B for sample and analysis data for tank 241-AX-101.

2.1 SAFETY SCREENING

The data needed to screen the waste in tank 241-AX-101 for potential safety problems are documented in *Tank Safety Screening Data Quality Objective* (Dukelow et al. 1995). These potential safety problems are exothermic conditions in the waste, flammable gases in the waste and/or tank headspace, and criticality conditions in the waste. Each condition is addressed separately below.

2.1.1 Exothermic Conditions (Energetics)

The first requirement outlined in the safety screening DQO is to ensure there are not sufficient exothermic constituents (organic or ferrocyanide) in tank 241-AX-101 to pose a safety hazard. Because of this requirement, the energetics in tank 241-AX-101 waste were evaluated. The safety screening DQO required the waste sample profile be tested for energetics every 24 cm (9.5 in.) to determine whether the energetics exceeded the safety threshold limit. The threshold limit for energetics is 480 J/g on a dry weight basis. Results obtained using differential scanning calorimetry (DSC) indicated all exotherms were below the safety limit of 480 J/g except one. The drainable liquid sample from core 226, segment 15 (S98T00514), showed an exotherm of 498.7 J/g. The core 226, segment 10, upper half sample also exceeded the 480 J/g for the upper 95 percent confidence interval on the mean (see Appendix C). However, the water was greater than 40 percent by weight in all drainable liquid samples. Therefore, exothermic activity is not expected to be a concern for this tank.

2.1.2 Flammable Gas

Headspace measurements were taken before the February 1998 push core samples. Flammable gas was not detected in the tank headspace (0 percent of the lower flammability limit [LFL]) before sampling. During sampling, the LFL in the drill string reached 60 percent, and an argon purge was used at segments 4 and 11 of core 228. High drill string readings were attributed to downtime between sampling, which resulted in gas buildup in the drill string. The highest headspace reading during sampling was 3 percent of the LFL. This is below the safety screening limit of 25 percent of the LFL. The June 1995 vapor phase measurements showed that the LFL in the tank headspace was <0.23 percent. Appendix B shows the results of the February 1998 and June 1995 vapor phase measurements.

2.1.3 Criticality

The safety screening DQO threshold for criticality, based on the total alpha activity, is 1 g/L. Because total alpha activity is measured in μCi/g instead of g/L, the 1 g/L limit is converted into units of μCi/g by assuming that all alpha decay originates from ^{239}Pu. The safety threshold limit is 1 g ^{239}Pu per liter of waste. Assuming that all alpha is from ^{239}Pu for an average composite sample density of 1.675 g/mL, 1 g/L of ^{239}Pu is 36.7 μCi/g of alpha activity. The maximum upper limit to a 95 percent confidence interval on the mean was 0.295 μCi/g (core 226, segment 8) indicating the potential for a criticality event is extremely low (see Appendix C). Therefore, criticality is not a concern for this tank.

2.2 FLAMMABLE GAS DATA QUALITY OBJECTIVE

Although not identified as an issue in Brown et al. (1997), the flammable gas DQO (Bauer and Jackson 1997) has been extended to apply to all tanks. Analyses and evaluations will change according to program needs until this issue is resolved. The unreviewed safety question for flammable gas safety issues is expected to be closed in fiscal year 1998, and final resolution of the flammable gas DQO is expected to be completed by September 30, 2001 (Johnson 1997). These dates are consistent with Milestones M-40-09 and M-40-00 (Ecology et al. 1997) to close out the unreviewed safety question for Watch List tanks and to close out all flammable gas issues for high priority tanks.

Retained gas samples (RGS) were taken and analyzed to address flammable gas issues (McDuffie 1995). No specific notification limits or "acceptance levels" have been determined to meet this DQO. In accordance with the RGS sampling plan (Brothersb 1997), one RGS sample was obtained from riser 9D, segment 8.

Retained gas sample results (Brothers 1997a) showed the gas in this sample occupied 17.8 $\pm$ 1.6 volume percent of the waste under in situ conditions. The composition of the retained gas in the RGS sample was estimated to be 60 $\pm$ 7.6 mol% H_2, 16 $\pm$ 4.1 mol% N_2, 11 $\pm$ 1.5 mol% N_2O, 2.4 $\pm$ 0.3 mol% CH_4, and 9.2 $\pm$ 3.8 mol% NH_3. The remainder were trace hydrocarbons.

The total ammonia concentration in the sample was 150,000 μmol NH_3/L waste, which corresponds to a dissolved ammonia concentration of about 5,800 μg NH_3/mL liquid (0.34 *M*). A comparison of the ammonia concentration found by RGS (5,800 μg NH_3/mL liquid) to the ammonia concentrations measured in tank 241-AX-101 grab samples (1,460 to 1,970 μg NH_3/mL) suggests the RGS value is an overestimate.

Appendix B summarizes the additional preliminary results of RGS testing reported in (Brothers 1997a). Assessments of flammable gas generation, retention, and release mechanisms; waste behavior modeling; and additional evaluations to assess potential impacts and waste behavior in tank 241-AX-101 are in progress.

2.3 ORGANIC COMPLEXANTS

The data required to support the issue of organic complexants are documented in *Memorandum of Understanding for the Organic Complexant Safety Issue Data Requirements* (Schreiber 1997). Energetics by DSC, total organic carbon (TOC) by persulfate and furnace oxidation, and sample moisture analyses were conducted to address the organic complexants issue.

Data results showed one exotherm (drainable liquid core 226, segment 15) slightly exceeded 480 J/g. Several other exotherms were observed. Consequently, TOC analyses were conducted for all samples exhibiting exotherms. For samples that exhibited exothermic activity, the results for the persulfate TOC analysis were calculated based on the dry weight of the sample and compared to the dry weight DSC results. Furnace oxidation TOC analysis was required forsamples in which the TOC by persulfate did not account for at least 75 percent of the exothermic energy. The TOC values ranged from <40 to 14,400. Analysis of variance analyses showed that all TOC values were well below 4.5 percent, and the probability of a propagating event is not a concern for this tank. Therefore, the tank is classified as "safe" for this issue.

2.4 ORGANIC SOLVENTS SAFETY SCREENING

The data required to support the organic solvent screening issue are documented in the *Data Quality Objective to Support Resolution of the Organic Solvent Safety Issue* (Meacham et al. 1997). The DQO requires tank headspace samples be analyzed for total nonmethane organic compounds to determine whether the organic extractant pool in the tank is a hazard. The purpose of this assessment is to ensure that an organic solvent pool fire or ignition of organic solvents cannot occur.

Vapor samples taken June 1995 showed the concentration of total nonmethane organic hydrocarbon in tank 241-AX-101 was 2.93 mg/m^3 with an estimated organic solvent pool size of 0.18 m^2 (Huckaby and Sklarew 1997), below the limit of 1 m^2.

2.5 HISTORICAL EVALUATION

The purpose of the historical evaluation is to determine whether the Hanford defined waste (HDW) model inventories (Agnew et al. 1997), which were based on process knowledge and historical information, agree with current tank inventories. If the historical model accurately predicts the waste characteristics as observed through sample characterization, the possibility exists for reducing the amount of total sampling and analysis needed. Data requirements for this evaluation are documented in *Historical Model Evaluation Data Requirements* (Simpson and McCain 1997).

A "gateway" analysis is a quick check to ensure that data obtained from sampling support the remainder of the historical evaluation analysis. Failure of the gateway analysis indicates the model waste composition estimate is not comparable to the sample data, and the tank is not a good tank on which to perform the historical evaluation. If the gateway analysis fails, the remainder of the sampling and analysis for the historical DQO will not be applied to the tank. If the gateway analysis passes, then further analyses will be performed on the waste samples as specified in the historical model evaluation DQO. Results of the historical model evaluation DQO will be used to quantify the errors associated with the historical tank content estimates (Simpson and McCain 1997).

The gateway analysis was applied to core samples 226 and 228 taken from tank 241-AX-101 in January and February 1998. Segments 11 to 14 of both cores were not analyzed because they were mostly liquids with little or no solids. The gateway analytes for tank 241-AX-101 are sodium, aluminum, chromium, water, nitrate, nitrite, phosphate, sulfate, carbonate, cesium-137, and strontium-90. These analytes were chosen because tank waste is predicted to be composed entirely of saltcake waste generated from the 242-A Evaporator (SMMA1) except for an 11 kL sludge heel. The gateway analysis required two tests be performed for each sample. The first test was to determine whether the concentration of each gateway analyte was over 10 percent of the predicted concentration. The second test was to determine whether the gateway analytes contributed to more than 85 percent (by mass) of the total waste. Appendix C shows the gateway analysis for tank 241-AX-101.

The first test passed. The second test also passed, with gateway analytes accounting for well over 85 percent of the waste. The concentration of gateway analytes was greater than 10 percent of the predicted value for all segments analyzed and very close to the predicted values for many analytes.

The sample results were also greater than 10 percent of the predicted supernatant mixing model (SMM) HDW values for tank 241-AX-101. For additional detail on the historical analysis, see Appendix C.

2.6 COMPATIBILITY

The data required to support the compatibility DQO are documented in Fowler (1995) and Mulkey and Miller (1997). Tank 241-AX-101 has not been interim stabilized to date. Sampling and analysis of grab samples were performed to the requirements of the waste compatibility DQO for tank 241-AX-101 as specified in the sampling and analysis plan (Sasaki 1997). A waste compatibility assessment based on the 1997 grab sample results was performed by tank farm operations. The waste compatibility assessment showed the waste in tank 241-AX-101 met all compatibility requirements, and the waste can be safely salt well pumped to tank 241-AN-101, provided requirements specified by the assessment are met (Blaak 1998).

An end state organic analysis for tank 241-AX-101 concluded that salt well pumping of the tank will not cause the waste in the tank to be categorized as "unsafe" (Estey 1997).

2.7 OTHER TECHNICAL ISSUES

Vapor samples were taken to address the *Data Quality Objective for Tank Hazardous Vapor Safety Screening* (Osborne and Buckley 1995). However, this is no longer an issue because headspace vapor (sniff) tests are required for the safety screening DQO (Dukelow et al. 1995), and the toxicity issue was closed for all tanks (Hewitt 1996). Appendix B discusses vapor sample results.

A factor in assessing tank safety is the heat generation and temperature of the waste. Heat is generated in the tanks from radioactive decay. An estimate of 10.4 kW (35,500 Btu/hr) for the tank heat load was given in Agnew et al. (1997). The tank heat load based on temperature was 4.19 kW (14,300 Btu/hr) (Kummerer et al. 1995). These estimates compare with an analytical estimate for the tank of 4.46 kW (15,200 Btu/hr) based on radionuclides that generate heat (see Table 2-1). All estimates are below the the limit of 11.7 kW (40,000 Btu/hr) that separates high- and low-heat-load tanks (Smith 1986).

2.8 SUMMARY

The results of all analyses performed to address potential safety issues showed the primary analytes did not exceed safety decision threshold limits except for one high exotherm observed in a drainable liquid sample. The exotherm was determined to be of little or no concern because TOC values were well below the threshold level for the organic complexants issue (Schreiber 1997), and the water content of the tank was greater than 40 percent by weight. Vapor samples showedthe estimated organic pool size was well below the safety limit of 1 m^2.

Although flammable gas in the tank headspace was well below 25 percent of the LFL, sample X-rays showed gas bubbles in the waste matrix. Retained gas samples for core 226, segment 8, showed the gas contains 60 percent hydrogen and occupies 17.8 volume percent of the waste.

The compatibility assessment based on 1997 grab samples showed that waste can safely be pumped from tank 241-AX-101 to tank 241-AN-101, provided requirements specified by the assessment are met (Blaak 1997).

Finally, the gateway analysis for the historical evaluation DQO passed, indicating that all of the waste recovered is SMMA1 saltcake.

Table 2-1 summarizes issues and results for tank 241-AX-101.

Table 2-1. Summary of Technical Issues.

Issue	Sub-issue	Result
Safety screening	Energetics	Several exotherms were observed, one slightly exceeded 480 J/g but was of no concern because the water content of samples was high.
	Flammable gas	The vapor measurement was reported 0 percent of the LFL (combustible gas meter).
	Criticality	All analyses were well below 36.7 μCi/g total alpha.
Flammable gas	Mechanisms for generation, retention and release Waste models	17.8 percent void was filled with retained gases in the RGS sample, 60 percent hydrogen content. There was a high ammonia concentration in the waste. Assessments of flammable gas generation, retention, and release mechanisms; waste behavior modeling and additional evaluations to assess potential impacts and waste behavior in tank 241-AX-101 are in progress.
Organic complexants	Safety categorization (Safe)	The TOC concentration was well below the 4.5% limit. This issue is expected to be closed in fiscal year 1998.
Organic solvents	Solvent pool size	Total nonmethane hydrocarbon was 2.93 mg/m^3. The estimated size of the organic solvent pool was 0.18 m^2. This issue is expected to be closed in fiscal year 1998.
Historical (gateway analysis)	Total mass of gateway analytes	Greater than 85% by weight of the waste was accounted for by the gateway analytes.
	Segment comparison with ≥10% of DQO values	All segments ≥10% of DQO values.
	Core composite and selected segment comparison with HDW	Segments and composites ≥10 percent of HDW values.
Compatibility	Waste compatibility assessment	All compatibility and safety requirements were in compliance to proceed with salt well pumping to tank 241-AN-101.

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3.0 BEST-BASIS STANDARD INVENTORY ESTIMATE

Information about chemical, radiological, and/or physical properties is used to perform safety analyses, engineering evaluations, and risk assessment associated with waste management activities, as well as regulatory issues. These activities include overseeing tank farm operations and identifying, monitoring, and resolving safety issues associated with these operations and with the tank wastes. Disposal activities involve designing equipment, processes, and facilities for retrieving wastes and processing them into a form that is suitable for long-term storage and disposal.

Chemical and radiological inventory information are generally derived using three approaches: 1) component inventories are estimated using the results of sample analyses, 2) component inventories are predicted using the HDW model based on process knowledge and historical information, or 3) a tank-specific process estimate is made based on process flowsheets, reactor fuel data, essential material usage, and other operating data.

An effort is underway to provide waste inventory estimates that will serve as standard characterization source terms for various waste management activities (Hodgson and LeClair 1996). As part of this effort, an evaluation of chemical information for tank 241-AX-101 was performed.

The evaluation included the following information:

- Two core samples obtained in January and February 1998
- Grab samples obtained in July 1997
- Tank 241-A-101 and tank 241-A-103 sample results
- HDW model estimates for total tank inventory, strontium recovery waste (SRR) composition, SMM inventory in tank 241-AX-101, and SMMA1 composition (Agnew et al. 1997).

Based on this evaluation, a best-basis inventory was developed for tank 241-AX-101 (see Tables 3-1 and 3-2). Samples results were used as the best-basis for SMMA1 waste. Two distinct layers were apparent from sample results: an upper solid (convective) layer and a lower liquid (nonconvective) layer. Because no sludge was recovered by push core sampling, HDW-model estimates for the SRR waste type were used to estimate the inventory of the sludge heel at the bottom of the tank. The total inventory is a combination of these two assessments. The sample-based engineering assessment was chosen as the best basis for analytes for which sample data was available. The HDW model inventory values were used for those analytes for which sample values and engineering assessment estimates were not

Table 3-1. Best-Basis Inventory Estimates for Nonradioactive Components in Tank 241-AX-101 (Effective March 31, 1998).

Analyte	Total Inventory (kg)	Basis (S, M, E or C)[1]	Comment
Al	1.24E+05	S/E	
Bi	0	E	Sample results less than detect
Ca	690	S/E	
Cl	22,700	S/E	
TIC as CO_3	1.42E+05	S/E	
Cr	3,430	S/E	
F	1,380	S/E	
Fe	3,360	S/E	
Hg	0	E	Simpson (1998)
K	19,300	S/E	
La	0	E	Sample results less than detect
Mn	0	E	Sample results less than detect
Na	8.39E+05	S/E	
Ni	0	E	Sample results less than detect
NO_2	4.34E+05	S/E	
NO_3	6.87E+05	E	
OH	4.00E+05	C	Charge balance calculation
Pb	399	S/E	
PO_4	17,600	S/E	IC result
SO_4	35,900	S/E	IC result
Si	563	S/E	
Sr	21.3	S/E	Sample results less than detect
TOC	14,300	S/E	
U_{TOTAL}	1,290	S/E	
Zr	0	E	Sample results less than detect

Notes:

TIC = total inorganic carbon

[1]S = sample-based (see Appendix B), M = HDW-model-based (Agnew et al. 1997), E = engineering assessment-based, and C = calculated by charge balance; includes oxides as hydroxide, not including CO_3, NO_2, NO_3, PO_4, SO_4, and SiO_3.

Table 3-2. Best-Basis Inventory Estimates for Radioactive Components in Tank 241-AX-101 Decayed to January 1, 1994 (Effective March 31, 1998). (3 sheets)

Analyte	Total Inventory (Ci)	Basis (S, M, or E)[1]	Comment
^{3}H	620	E/M	Based on HDW SRR and SMM inventory for saltcake and liquids
^{14}C	6.00	E	Tank 241-A-103 core and SRR
^{59}Ni	11.9	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{60}Co	114	S/E	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{63}Ni	1,170	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{79}Se	13.5	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{90}Sr	1.36E+05	S/E	
^{90}Y	1.36E+05	S/E	Calculated from parent
^{93m}Nb	48.3	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{93}Zr	64.1	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{99}Tc	267	E	Tank 241-A-103 core and SRR
^{106}Ru	0.050	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{113m}Cd	298	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{125}Sb	562	E/M	
^{126}Sn	20.7	E/M	
^{129}I	0.02	E	Tank 241-A-103 core and SRR
^{134}Cs	11.0	E/M	
^{137}Cs	7.52E+05	S/E	
^{137m}Ba	7.11E+05	S/E	Calculated from parent
^{151}Sm	48,200	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{152}Eu	16.6	E/M	Based on HDW SRR and SMM inventory for saltcake and liquids
^{154}Eu	532	E	Tank 241-AX-101 grab

Table 3-2. Best-Basis Inventory Estimates for Radioactive Components in Tank 241-AX-101 Decayed to January 1, 1994 (Effective March 31, 1998). (3 sheets)

Analyte	Total Inventory (Ci)	Basis (S, M, or E)[1]	Comment
^{155}Eu	1,580	E	Tank 241-AX-101 grab
^{226}Ra	8.29E-04	E/M	Based on HDW SRR and SMM inventory for saltcake and liquids
^{227}Ac	0.00466	E/M	Based on HDW SRR and SMM inventory for saltcake and liquids
^{228}Ra	1.02	E/M	Based on HDW SRR and SMM inventory for saltcake and liquids
^{229}Th	0.0235	E/M	Based on HDW SRR and SMM inventory for saltcake and liquids
^{231}Pa	0.0146	E/M	Based on HDW SRR and SMM inventory for saltcake and liquids
^{232}Th	0.110	E/M	Based on HDW SRR and SMM inventory for saltcake and liquids
^{232}U	0.789	S/E/M	Based on U_{TOTAL} ratioed to HDW model uranium isotopes
^{233}U	3.02	S/E/M	Based on U_{TOTAL} ratioed to HDW model uranium isotopes
^{234}U	0.484	S/E/M	Based on U_{TOTAL} ratioed to HDW model uranium isotopes
^{235}U	0.0192	S/E/M	Based on U_{TOTAL} ratioed to HDW model uranium isotopes
^{236}U	0.0156	S/E/M	Based on U_{TOTAL} ratioed to HDW model uranium isotopes
^{237}Np	2.59	E/M	Based on HDW SRR and SMM inventory for saltcake and liquids
^{238}Pu	14.0	E/M	Based on $^{239/240}Pu$ ratioed to HDW model alpha isotopes
^{238}U	0.431	S/E/M	Based on U_{TOTAL} ratioed to HDW model uranium isotopes
^{239}Pu	399	E/M	Based on $^{239/240}Pu$ ratioed to HDW model alpha isotopes
^{240}Pu	72.8	E	Based on $^{239/240}Pu$ ratioed to HDW model alpha isotopes

Table 3-2. Best-Basis Inventory Estimates for Radioactive Components in Tank 241-AX-101 Decayed to January 1, 1994 (Effective March 31, 1998). (3 sheets)

Analyte	Total Inventory (Ci)	Basis (S, M, or E)[1]	Comment
^{241}Am	438	E	Tank 241-A-103 core
^{241}Pu	987	E/M	Based on $^{239/240}Pu$ ratioed to HDW model alpha isotopes
^{242}Cm	0.660	S/M	Based on ^{241}Am ratioed to HDW model alpha isotopes
^{242}Pu	0.00566	E/M	Based on $^{239/240}Pu$ ratioed to HDW model alpha isotopes
^{243}Am	0.0179	S/M	Based on ^{241}Am ratioed to HDW model alpha isotopes
^{243}Cm	0.0590	S/M	Based on ^{241}Am ratioed to HDW model alpha isotopes
^{244}Cm	1.08	S/M	Based on ^{241}Am ratioed to HDW model alpha isotopes

Note:

[1]S = sample-based, M = HDW model-based (Agnew et al. 1997a), and E = engineering assessment-based.

available. Engineering assessment values were selected for trace analytes with little supporting sample data. The inventory values reported in Tables 3-1 and 3-2 are subject to change. Refer to the Tank Characterization Database for the most current inventory values (LMHC 1998).

Best-basis tank inventory values are derived for 46 key radionuclides (Kupfer et al. 1997), all decayed to a common report date of January 1, 1994. Often, waste sample analyses have only reported ^{90}Sr, ^{137}Cs, $^{239/240}Pu$, and total uranium (or total beta and total alpha), while other key radionuclides such as ^{60}Co, ^{99}Tc, ^{129}I, ^{154}Eu, ^{155}Eu, and ^{241}Am, have been infrequently reported. For this reason, it has been necessary to derive most of the 46 key radionuclides by computer models. These models estimate radionuclide activity in batches of reactor fuel, account for the split of radionuclides to various separations plant waste streams, and track their movement with tank waste transactions. These computer models are described in Kupfer et al. (1997) and Watrous and Wootan (1997). Model generated values for radionuclides in any of 177 tanks are reported in Agnew et al. 1997. The best-basis value for any one analyte may be either a model result or a sample or engineering assessment-based result if available.

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4.0 RECOMMENDATIONS

Push core samples taken in 1998 were analyzed to address safety screening, flammable gas, organic complexant, and historical issues. All safety screening criteria were met except one exotherm exceeded 480 J/g. This was not of concern because the water content of the sample was high, and the TOC was below 4.5 weight percent.

Vapor monitoring tests showed retained gases in the tank headspace ranged from 0 to 3 percent of LFL during sampling. The RGS samples showed 17.8 percent (by volume) of the waste contained retained gas, with 60 percent hydrogen content and high ammonia concentrations. Additional flammable gas evaluations are in progress.

The tank is classified as "safe" for the organic complexants issue because TOC results were well below 4.5 percent.

The historical evaluation (Simpson and McCain 1997) showed that gateway analytes accounted for more than 85 percent of the waste for all segments and greater than 10 percent of the DQO and HDW model (Agnew et al. 1997) values. This indicates that the waste is predominantly A1 saltcake. The HDW model does not predict a separate free liquid layer, evident from sample observations.

Vapor samples taken in 1995 were used to satisfy the organic solvents issue. The organic pool size was estimated to be 0.18 m^2, well below the limit of $1m^2$.

Grab samples taken in 1997 were used to satisfy the compatibility DQO. All compatibility and operational safety requirements were in compliance to proceed with pumping to tank 241-AN-101.

Table 4-1 summarizes the Project Hanford Management Contractor (PHMC) TWRS Program review status and acceptance of the sampling and analysis results reported in this TCR. All issues required to be addressed by sampling and analysis are listed in column 1 of Table 4-1. Column 2 indicates by "yes" or "no" whether issue requirements were met by the sampling and analysis performed. Column 3 indicates concurrence and acceptance by the program in PHMC/TWRS that is responsible for the applicable issue. A "yes" in column 3 indicates that no additional sampling or analyses are needed. Conversely, "no" indicates additional sampling or analysis may be needed to satisfy issue requirements.

Table 4-1. Acceptance of Tank 241-AX-101 Sampling and Analysis.

Issue	Sampling and Analysis Performed	Program[1] Acceptance
Safety screening DQO (Dukelow et al. 1995)	Yes	Yes
Flammable gas DQO (Bauer and Jackson 1998)	Yes	Yes
Organic complexant memorandum of understanding (Schreiber 1997)	Yes	Yes
Organic solvents DQO	Yes	Yes
Historical evaluation DQO (Simpson and McCain 1997)	Yes	Yes
Waste compatibility DQO (Fowler 1995)	Yes	Yes

Note:
[1]PHMC TWRS Program Office

Table 4-2 summarizes the status of PHMC TWRS Program review and acceptance of the evaluations and other characterization information contained in this report. Column 1 lists the different evaluations performed in this report. Column 2 shows whether issue evaluations have been completed or are in progress. Column 3 indicates concurrence and acceptance with the evaluation by the program in PHMC/TWRS that is responsible for the applicable issue. A "yes" indicates that the evaluation is completed and meets all issue requirements.

Table 4-2. Acceptance of Evaluation of Characterization Data and Information for Tank 241-AX-101.

Issue	Evaluation Performed	TWRS[1] Program Acceptance
Safety screening DQO (Dukelow et al. 1995)	Yes	Yes
Flammable gas DQO[2](Bauer and Jackson 1998)	(in progress)	n/a
Organic complexant memorandum of understanding[3] (Schreiber 1997)	Yes	Yes
Organic solvents DQO[3] (Mecham et al. 1997)	Yes	Yes
Historical evaluation DQO (Simpson and McCain 1997)	Yes	Yes
Waste compatibility DQO (Fowler 1995)	Yes	Yes

Notes:

[1]PHMC TWRS Program Office

[2]The flammable gas unreviewed safety question gas is expected to be closed in fiscal year 1998, final closure of this issue for all tanks is scheduled for fiscal year 2002.

[3]The organic solvents and organic complexants safety issues are expected to be closed in fiscal year 1998.

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5.0 REFERENCES

Agnew, S. F., J. Boyer, R. A. Corbin, T. B. Duran, J. R. Fitzpatrick, K. A. Jurgensen, T. P. Ortiz, and B. L. Young, 1997, *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4*, LA-UR-96-3860, Los Alamos National Laboratory, Los Alamos, New Mexico.

Bauer, R. E., and L. P. Jackson, 1998, *Data Quality Objective to Support Resolution of the Flammable Gas Safety Issue*, HNF-SD-WM-DQO-004, Rev. 3A, DE&S Hanford, Inc. for Fluor Daniel Hanford, Inc., Richland, Washington.

Blaak, T. M., 1998, *Waste Compatibility Assessment of Tank 241-AX-101 Waste (ETF-98-01) with Tank 241-AN-101 Waste*, (internal memorandum 74100-98-003 to R. A. Dodd, February 20), Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc. Richland, Washington.

Brevick, C. H., J. L. Stroup, and J. W. Funk, 1997, *Historical Tank Content Estimate for the Northeast Quadrant of the Hanford 200 Areas*, WHC-SD-WM-ER-349, Rev. 1B, Fluor Daniel Northwest, Inc. for Fluor Daniel Hanford, Inc., Richland, Washington.

Brothers, J. W., 1997a, *Preliminary Retained Gas Sampler Measurement Results for Hanford Waste Tank 241-AX-101*, (letter TWS98.37 to R. E. Bauer, November 10), Pacific Northwest National Laboratory, Richland, Washington.

Brothers, J. W., 1997b, *Sampling Plan for Tank 241-AX-101 Retained Gas Sampler Deployment*, (letter TWS98.05 to R. E. Bauer, November 10), Pacific Northwest National Laboratory, Richland, Washington.

Brown, T. M., J. W. Hunt, and L. J. Fergestrom, 1997, *Tank Characterization Technical Sampling Basis*, HNF-SD-WM-TA-164, Rev. 3, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

Dukelow, G. T., J. W. Hunt, H. Babad, and J. E. Meacham, 1995, *Tank Safety Screening Data Quality Objective*, WHC-SD-WM-SP-004, Rev. 2, Westinghouse Hanford Company, Richland, Washington.

Ecology, EPA, and DOE, 1997, *Hanford Federal Facility Agreement and Consent Order*, as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.

Esch, 1998, *Tank 241-AX-101, Cores 226 and 228, Analytical Results for the Final Report*, HNF-SD-WM-DP-300, Rev. 0, Waste Management Federal Services of Hanford Inc. for Fluor Daniel Hanford, Inc., Richland, Washington.

Estey, S. D., 1997, *Organic End State Analysis of Tank 241-AX-101*, HNF-SD-WM-CN-124, Rev. 0, Lockheed Martin Hanford Corp.for Fluor Daniel Hanford, Inc., Richland, Washington.

Fowler, R. D., 1995, *Data Quality Objective for Tank Farms Waste Compatibility Program*, WHC-SD-WM-DQO-001, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Hanlon, B. M., 1998, *Waste Tank Summary Report for Month Ending March 31, 1998*, HNF-EP-0182-120, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

Hewitt, E. R., 1996, *Tank Waste Remediation System Resolution of Potentially Hazardous Vapor Issues*, WHC-SD-TWR-RPT-001, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Hodgson, K. M., and M. D. LeClair, 1996, *Work Plan for Defining a Standard Inventory Estimate for Wastes Stored in Hanford Site Underground Tanks,* WHC-SD-WM-WP-311, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Huckaby, J. L., and D. S. Sklarew, 1997, *Screening for Organic Solvents in Hanford Waste Tanks Using Organic Vapor Concentrations*, PNNL-11698, Pacific Northwest National Laboratory, Richland, Washington.

Johnson, G. D., 1997, *Strategy for Resolution of the Flammable Gas Safety Issue*, HNF-SD-WM-ER-680, Rev. 0, DE&S Hanford, Inc. for Fluor Daniel Hanford, Inc., Richland Washington.

Kummerer, M., 1995, *Heat Removal Characteristics of Waste Storage Tanks*, WHC-SD-WM-SARR-010, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Kupfer, M. J., A. L. Boldt, B. A. Higley, K. M. Hodgson, L. W. Shelton, B. C. Simpson, R. A. Watrous, S. L. Lambert, D. E. Place, R. M. Orme , G. L. Borsheim, N. G. Colton, M. D. LeClair, R. T. Winward, and W. W. Schulz, 1997, *Standard Inventories of Chemicals and Radionuclides in Hanford Site Tank Wastes*, HNF-SD-WM-TI-740, Rev. 0, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

LMHC, 1998, Best-Basis Inventory for Tank 241-AX-101, July 1, Tank Characterization Database, Internet at http://twins.pnl.gov:8001/TCD/main.html.

McDuffie, N. G., 1995, *Flammable Gas Data Requirements for Core Sample Analysis Developed through the Data Quality Objectives Process*, WHC-SD-WM-DQO-004, Rev. 2, Westinghouse Hanford Company, Richland, Washington.

Meacham, J. E., D. L. Banning, M. R. Allen, and L. D. Muhlestein, 1997, *Data Quality Objective to Support Resolution of the Organic Solvent Safety Issue*, HNF-SD-WM-DQO-026, Rev. 0, DE&S Hanford, Inc. for Fluor Daniel Hanford, Inc., Richland, Washington.

Mulkey, C. H., and M. S. Miller, 1997, *Data Quality Objectives for Tank Farms Waste Compatibility Program*, WHC-SD-WM-DQO-001, Rev. 2, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

Osborne, J. W. and L. L. Buckley, 1995, *Data Quality Objectives for Tank Hazardous Vapor Safety Screening*, WHC-SD-WM-DQO-002, Rev. 2, Westinghouse Hanford Company, Richland, Washington.

Public Law 101-510, 1990, "Safety Measures for Waste Tanks at Hanford Nuclear Reservation," Section 3137 of *National Defense Authorization Act for Fiscal Year 1991*.

Sasaki, L. M. 1997, Compatibility Grab Sampling and Analyis Plan for Fiscal Year 1997, WHC-SD-WM-TSAP-115, Rev. 0G, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

Schreiber, R. D., 1997, *Memorandum of Understanding for the Organic Complexant Safety Issue Data Requirements*, HNF-SD-WM-RD-060, Rev. 0, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

Simpson, B. C.,1998, *Best-Basis Inventory Change Package for Reconciliation of Mercury Values*, change package 7, (internal memorandum TA-120-98-005 to J. W. Cammann, February 26) Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

Simpson, B. C., and D. J. McCain, 1997, *Historical Model Evaluation Data Requirements*, HNF-SD-WM-DQO-018, Rev. 2, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

Smith, D. A., 1986, *Single-Shell Tank Isolation Safety Analysis Report*, WHC-SD-WM-SAR-006, Rev. 2, Westinghouse Hanford Company, Richland, Washington.

Swaney, S. L., 1993, *Waste Level Discrepancies Between Manual Level Readings and Current Waste Inventory for Single-Shell Tanks* (internal memorandum 7C242-93-038 to G. T. Frater, December 10), Westinghouse Hanford Company, Richland, Washington.

Watrous, R. A., and D. W. Wootan, 1997, *Activity of Fuel Batches Processed Through Hanford Separations Plants, 1944 Through 1989,* HNF-SD-WM-TI-794, Rev. 0, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford Inc., Richland, Washington.

APPENDIX A

HISTORICAL TANK INFORMATION

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APPENDIX A

HISTORICAL TANK INFORMATION

Appendix A describes tank 241-AX-101 based on historical information. For this report, historical information includes information about the fill history, waste types, surveillance, or modeling data about the tank. This information is necessary for providing a balanced assessment of sampling and analytical results.

This appendix contains the following information:

- **Section A1.0**: Current tank status, including the current waste levels and the tank stabilization and isolation status
- **Section A2.0**: Information about the tank design
- **Section A3.0**: Process knowledge about the tank, the waste transfer history, and the estimated contents of the tank based on modeling data
- **Section A4.0**: Surveillance data for tank 241-AX-101, including surface-level readings, temperatures, and a description of the waste surface based on photographs
- **Section A5.0**: Appendix A References.

A1.0 CURRENT TANK STATUS

As of March 31, 1998, tank 241-AX-101 contained an estimated 2,830 kL (748 kgal) of noncomplexed waste (Hanlon 1998). The waste volumes were estimated using a photographic evaluation and a Food Instrument Corporation surface-level gauge. Table A1-1 shows the volumes of the waste phases found in the tank.

Tank 241-AX-101 is out of service as are all single-shell tanks. This tank is categorized as sound with partial interim isolation completed in 1982. It has not been interim stabilized to date. The tank is passively ventilated and is on the Watch List for flammable gas (Public Law 101-510).

Table A1-1. Tank Contents Status Summary.

Waste Type	kL (kgal)
Total waste	2,830 (748)
Supernatant	0 (0)
Sludge	11 (3)
Saltcake[1]	1,360 (359)
Drainable interstitial liquid[2]	2,142 (566)
Drainable liquid remaining[2]	2,142 (566)
Pumpable liquid remaining[3]	931 (246)

Notes:

[1]Volume differs from Hanlon (1998). Does not include free liquid volume.

[2]Volume differs from Hanlon (1998). Includes 386 kgal of free liquid included by Hanlon as part of the saltcake layer and assumes the drainable porosity of the saltcake is 50 volume percent (see Appendix D3.3).

[3]Based on tank 241-A-101 evaluation (Field et al. 1997), assumes 43.5 percent of the liquid is pumpable.

A2.0 TANK DESIGN AND BACKGROUND

The AX Tank Farm was constructed from 1963 to 1964 in the 200 East Area of the Hanford Site. The AX Tank Farm contains four 100 series tanks. These tanks have a capacity of 3,800 kL (1,000 kgal) and a diameter of 23 m (75 ft). Built according to the fifth generation design, the 241-AX Tank Farm was designed for boiling or self-concentrating waste (for a 5 to 10 year boiling period) with a maximum fluid temperature of 121 °C (250 °F) (Leach and Stahl 1997). Because the tanks are designed specifically for boiling waste, airlift circulators were installed to control waste temperatures.

The single-shell tanks in the 241-AX Tank Farm are constructed of 30-cm (1-ft)-thick reinforced concrete with a 6.4 mm (1/4 in.) mild carbon steel liner on the bottom and sides and a 38-cm (1.25-ft)-thick domed concrete top. They have a flat bottom with a 15 cm (16 in.) radius knuckle and a 9.9-m (32.5-ft) operating depth. A grid of drain slots exits below the tank liner of each tank. There are no cascade overflow lines between the tanks in the 241-AX Tank Farm. The tanks are covered with approximately 6 ft of overburden.

Tank 241-AX-101 has 59 risers according to the drawings and engineering change notices. The risers range in diameter from 100 mm (4 in.) to 1.1 m (42 in.). Table A2-1 shows numbers, diameters, and descriptions of the risers. A plan view that depicts the riser and nozzle configuration is shown as Figure A2-1. Risers 3A, 9D, and 9G are tentatively available for sampling (Lipnicki 1997). Riser 3A is 36 cm (14 in.) in diameter, and risers 9D and 9G are 15 cm (6 in.) in diameter. A tank cross section showing the approximate waste level along with a schematic of the tank equipment is in Figure A2-2.

Table A2-1. Tank 241-AX-101 Risers[1] (2 sheets)

Number	Diameter (In.)	Description and Comments
1A	34	Steam coil
1B	34	Pump pit 01B sludge sluice
3A[2]	16	B-222 observation port
4	20	Vent line, below grade
5A	12	Salt well screen
5B	12	Pump mount
6[2]	4	Flange, weather covered [Benchmark Change Engineering Order-22975 December 11, 1986]
7A	4	Profile temperature, weather covered
7B	4	Profile temperature, weather covered
7C	4	Profile temperature, weather covered
7D	4	Profile temperature, weather covered
8A	6	Dry well
8B	6	Dry well
8C	6	Dry well [ENRAF™ Engineering Change Notice-619368 April 4, 1995]
8D	6	Dry well
8E	6	Dry well
8F	6	Blind flange, [Benchmark Change Engineering Order-22975 December 11, 1986]
8G	6	Dry well
9A	6	Liquid observation well
9B	6	Thermocouple tree
9C	6	Food Instrument Corporation
9D[2]	6	Sludge Measurement Port
9E[2]	6	Sludge Measurement Port
9F[2]	6	Blank [Hydrogen monitor W-396-006 September 13, 1994]
9G[2]	6	Sludge Measurement Port

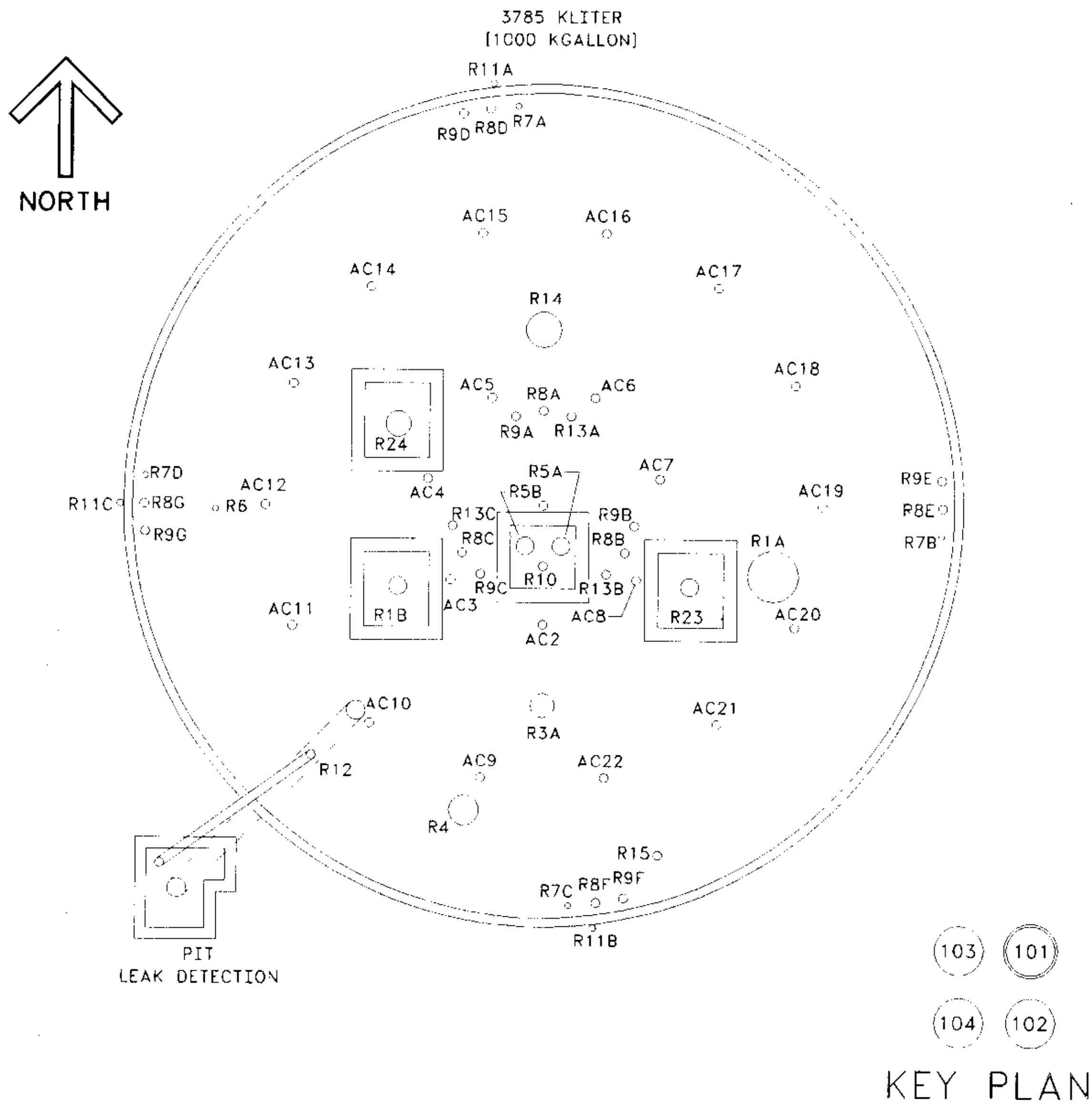
Table A2-1. Tank 241-AX-101 Risers[1] (2 sheets)

Number	Diameter (In.)	Description and Comments
10	4	Distributor pit 01A drain
12	4	Leak detection pit drain, below grade
13A	4	Temperature profile, weather covered
13B	4	Temperature profile, weather covered
13C	4	Temperature profile, weather covered
14	42	Steam coil
15	4	Future condensate, below grade
23	12	Sluicing nozzle
24	12	Sluicing nozzle
AC1-22	6	22 - Air circulators capped in instrument inclosure

Notes:

[1]Alstad (1993), Tran (1993), Vitro (1977 and 1988), HAPO (1975), and ARCHO (1976a and 1996b)
[2]Denotes risers tentatively available for sampling (Lipnicki 1997)

Figure A2-1. Riser Configuration for Tank 241-AX-101.



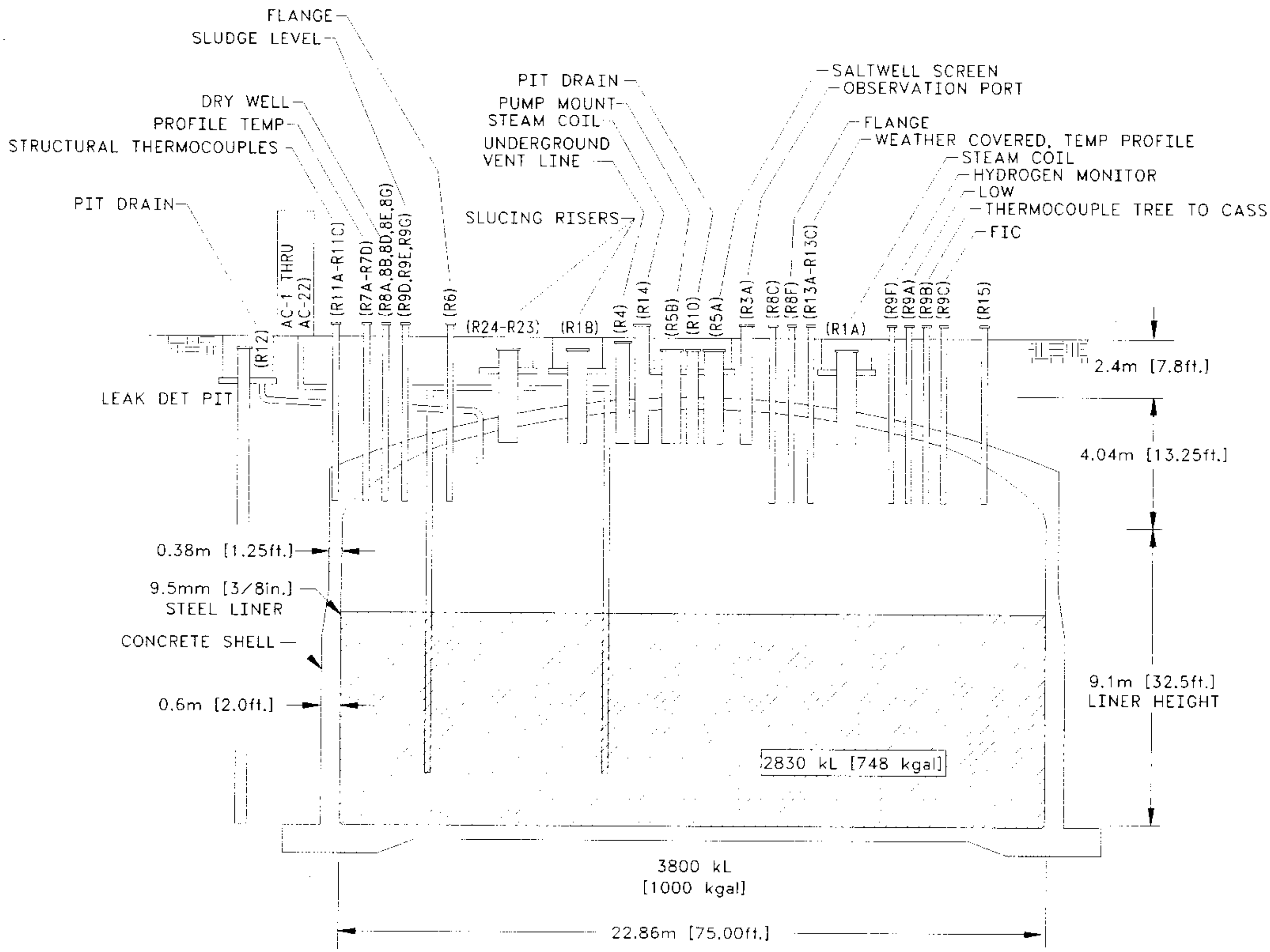


Figure A2-2. Tank 241-AX-101 Cross Section and Schematic.

A3.0 PROCESS KNOWLEDGE

The sections below 1) provide information about the transfer history of tank 241-AX-101, 2) describe the process wastes that made up the transfers, and 3) estimate the current tank contents based on transfer history.

A3.1 WASTE TRANSFER HISTORY

Table A3-1 summarizes the waste transfer history of tank 241-AX-101 (Agnew et al. 1997a). Tank 241-AX-101 received fission product waste and organic wash waste from the Plutonium Uranium Extraction (PUREX) facility and supernatant from tanks 241-A-102, 241-A-103, 241-AX-102, and 241-B-112 from the first quarter of 1965 until the last quarter of 1967. From the third quarter of 1965 to the fourth quarter of 1967, supernatant was transferred from tank 241-AX-101 to tanks 241-AX-102, 241-AX-103 and 241-A-102. An electric coil was inserted into tank 241-AX-101, and condensate was boiled off between the fourth quarter of 1966 and the fourth quarter of 1967 (Anderson 1990). Cesium/strontium recovery waste from B Plant was sent to tank 241-AX-101 from the first quarter of 1968 to the first quarter of 1969. The tank received PUREX waste and PUREX low-level waste from the second quarter of 1968 to the second quarter of 1969. Tank 241-AX-101 was then removed from service as a boiling waste receiver tank.

Waste was transferred to tanks 241-A-102, 241-A-103, and 241-AX-103 from the first quarter of 1968 to the second quarter of 1976. From the second quarter of 1973 to the third quarter of 1974, the tank received supernatant from tanks 241-A-104 and 241-AX-102 and received water from dry well installation processes. From the third quarter of 1975 to the second quarter of 1976, the tank received SRR. The tank was also sluiced from the third quarter of 1975 to the second quarter of 1976 to remove the strontium/cesium recovery waste. In the third quarter of 1976, only 11 kL (3 kgal) of sludge remained in the tank (Agnew et al. 1997b).

The tank received double-shell slurry feed from the 242-A Evaporator through tanks 241-A-102 and 241-A-103 from the fourth quarter of 1976 until the fourth quarter of 1980. In the fourth quarter of 1980, supernatant was transferred to tank 241-AW-103. The tank was pumped, and salt well liquid was transferred to tank 241-AN-101 in the fourth quarter of 1987.

Table A3-1. Tank 241-AX-101 Major Transfers.[1] (2 sheets)

Transfer Source	Transfer Destination	Waste Type	Time Period	Estimated Waste Volume	
				kL	kgal
PUREX		Fission product waste	1965	995	263
PUREX		Organic wash waste	1965-1967	7,040	1,860
A-103		Supernatant	1965	2,110	557
A-102		Supernatant	1967	2,660	704
B-112		Supernatant	1965	2,300	607
	AX-102, AX-103, A-102	Supernatant	1965-1967	-10,600	-2,790
AX-102		Supernatant	1967	5,110	1,350
	Crib	Condensate	1966-1967	-7,060	-1,870
B Plant		B Plant Cs/Sr recovery waste	1968-1969	11,500	3,030
PUREX		PUREX high-level waste	1968	151	40
PUREX		PUREX low-level waste	1968-1969	1,470	389
	A-102	Supernatant	1968-1969	-12,200	-3,220
Removed from service as a boiling waste receiver tank in 1969					
	AX-103	Supernatant	1972-1976	-8,550	-2,260
A-104		Supernatant	1973-1974	5,410	1,430
	A-103	Supernatant	1974	-484	-128
Dry wells		Process water	1974	75.7	20
AX-102		Supernatant	1975	526	139
B-Plant		SRR	1975	765	202
	B Plant	Supernatant	1975	-980	-259
	B Plant	Sludge	1975-1976	-250	-65
A-102		242-A Evaporator	1976-1980	14,200	3,750
	A-102	Supernatant	1977-1980	-9,730	-2,570

Table A3-1. Tank 241-AX-101 Major Transfers.[1] (2 sheets)

Transfer Source	Transfer Destination	Waste Type	Time Period	Estimated Waste Volume	
				kL	kgal
A-103		Supernatant	1980	1,320	348
	AW-103	Supernatant	1980	-3,000	-792
	AN-101	Saltwell liquor	1987	-53.0	-14

Note:
[1]Agnew et al. (1997a)

A3.2 HISTORICAL ESTIMATION OF TANK CONTENTS

The historical transfer data used for this estimate are from the following sources:

- The *Waste Status and Transaction Record Summary: WSTRS, Rev. A*, (Agnew et al. 1997b) is a tank-by-tank quarterly summary spreadsheet of waste transactions.

- The *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al. 1997a) contains the Hanford defined waste (HDW list, the supernatant mixing model (SMM), the tank layer model (TLM), and the historical tank content estimate.

- The HDW list comprises approximately 50 waste types defined by concentration for major analytes/compounds for sludge and supernatant layers.

- The TLM defines the solid layers in each tank using waste composition and waste transfer information.

- The SMM is a subroutine within the HDW model that calculates the volume and composition of certain supernatant blends and concentrates.

Using these records, the TLM defines the solids layer in each tank. The SMM uses information from the *Waste Status and Transaction Record Summary*, the TLM, and the HDW list to describe the supernatants and concentrates in each tank. Together the *Waste Status and Transaction Record Summary*, TLM, SMM, and HDW list determine the inventory estimate for each tank. These model predictions are considered estimates that require further evaluation using analytical data.

Based on Agnew et al. (1997a), tank 241-AX-101 contains a bottom heel of SRR and PUREX high-level waste generated between 1963 and 1967. The remainder of the waste is classified as supernatant mixing model A1 saltcake (SMMA1). Figure A3-1 shows the estimated waste types and volumes for the tank.

The SRR and PUREX high-level waste layers are expected to contain greater than one weight percent of sodium, iron, nitrite, carbonate, hydroxide and silicate. Strontium recovery waste also is expected to contain greater than one weight percent of organic species. Strontium recovery waste and PUREX high-level waste waste are expected to contain much greater radioactivity than the SMMA1 waste because of the presence of cesium, strontium, and samarium. The SRR and PUREX high-level waste are also expected to contain higher levels of alpha isotopes than the SMMA1 layer. The SMMA1 layer in tank 241-AX-101 is expected to contain greater than one weight percent of sodium, aluminum, hydroxide, nitrate, nitrite, phosphate, carbonate and sulfate. The SMMA1 is expected to be low in strontium with higher levels of cesium compared to strontium concentrations.

Table A3-2 shows the historical estimate of the expected waste constituents and their concentrations.

Figure A3-1. Tank Layer Model.

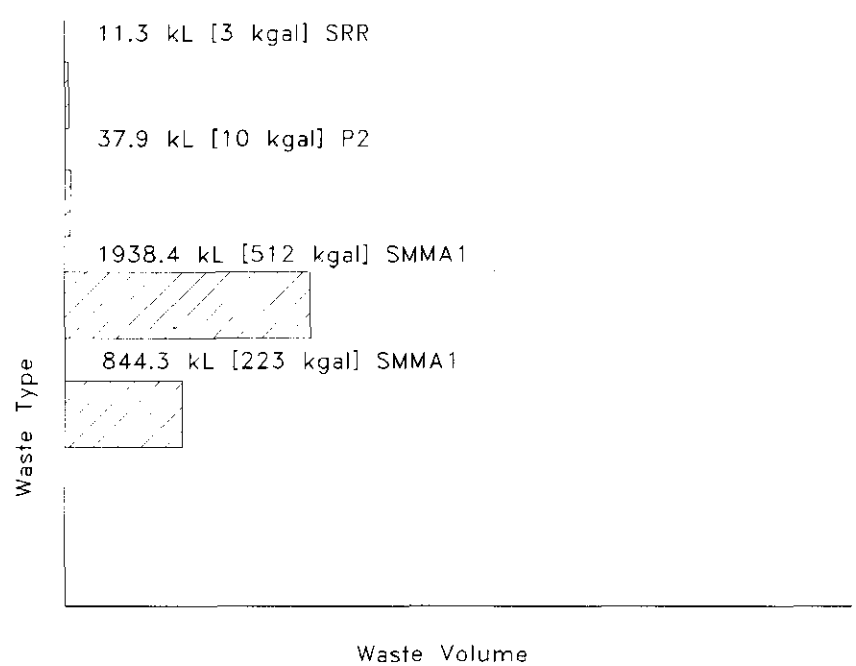


Table A3-2. Historical Tank Inventory Estimate.[1] (4 sheets)

Single-Shell Tank 241-AX-101					
Total Inventory Estimate[1]					
Physical Properties				**-95 CI**	**+95 CI**
Total waste	4.35E+06 (kg)	(748 kgal)	----	----	----
Heat load	10.4 (kW)	35,500 (Btu/hr)	----	9.10	11.0
Bulk density[3]	1.54 (g/cm^3)	----	----	1.47	1.56
Water wt%[3]	38.9	----	----	36.5	42.4
TOC wt% C (wet)[3]	1.30	----	----	0.721	1.87
Chemical Constituents	***M*/L**	**ppm**	**kg**	**-95 CI (*M*/L)**	**+95 CI (*M*/L)**
Na^+	12.2	1.82E+05	7.92E+05	11.0	13.0
$Al3^+$	1.52	2.68E+04	1.16E+05	1.25	1.60
Fe^{3+} (total Fe)	5.29E-02	1.93E+03	8.37E+03	4.89E-02	5.41E-02
Cr^{3+}	0.104	3.54E+03	1.54E+04	9.31E-02	0.118
Bi^{3+}	1.11E-03	151	654	1.03E-03	1.20E-03
La^{3+}	2.00E-05	1.81	7.86	1.48E-05	2.52E-05
Hg^{2+}	8.95E-06	1.17	5.08	8.54E-06	9.35E-06
Zr (as $ZrO(OH)_2$)	1.32E-04	7.86	34.2	1.22E-04	1.42E-04
Pb^{2+}	1.22E-03	165	718	9.30E-04	1.52E-03
Ni^{2+}	5.31E-03	203	882	4.53E-03	5.55E-03
Sr^{2+}	0	0	0	0	0
Mn^{4+}	4.15E-03	148	645	3.60E-03	4.70E-03
Ca^{2+}	2.86E-02	745	3.24E+03	2.53E-02	3.02E-02
K+	5.84E-02	1.49E+03	6.47E+03	4.94E-02	7.28E-02
OH^-	8.64	9.57E+04	4.16E+05	7.34	8.99
NO_3^-	3.82	1.54E+05	6.71E+05	3.61	4.04
NO_2^-	2.23	6.68E+04	2.91E+05	1.75	2.61
CO_3^{2-}	0.466	1.82E+04	7.91E+04	0.429	0.495
PO_4^{3-}	8.38E-02	5.19E+03	2.25E+04	7.17E-02	9.64E-02
SO_4^{2-}	0.260	1.62E+04	7.06E+04	0.204	0.300

Table A3-2. Historical Tank Inventory Estimate.[1] (4 sheets)

Single-Shell Tank 241-AX-101					
Total Inventory Estimate[1]					
Chemical Constituents (Cont'd)	***M*/L**	**ppm**	**kg**	**-95 CI (*M*/L)**	**+95 CI (*M*/L)**
Si (as SiO_3^{2-})	9.47E-02	1.73E+03	7.53E+03	7.46E-02	0.103
F^-	6.05E-02	749	3.26E+03	5.09E-02	7.61E-02
Cl^-	0.210	4.84E+03	2.11E+04	0.178	0.221
$C_6H_5O_7^{3-}$	2.99E-02	3.68E+03	1.60E+04	2.71E-02	3.43E-02
$EDTA^{4-}$	3.26E-02	6.12E+03	2.66E+04	1.06E-02	5.49E-02
$HEDTA^{3-}$	5.85E-02	1.04E+04	4.54E+04	1.44E-02	0.103
glycolate$^-$	0.117	5.73E+03	2.49E+04	7.32E-02	0.162
acetate$^-$	2.18E-02	836	3.64E+03	1.72E-02	2.89E-02
oxalate^{2-}	2.62E-05	1.50	6.52	2.33E-05	2.90E-05
DBP	2.43E-02	3.32E+03	1.45E+04	2.00E-02	3.08E-02
butanol	2.43E-02	1.17E+03	5.10E+03	2.00E-02	3.08E-02
NH_3	5.64E-02	624	2.71E+03	4.75E-02	7.12E-02
$Fe(CN)_6^{4-}$	0	0	0	0	0
Radiological Constituents	**Ci/L**	**μCi/g**	**Ci**	**-95 CI (Ci/L)**	**+95 CI (Ci/L)**
^{3}H	2.21E-04	0.144	625	1.51E-04	2.59E-04
^{14}C	3.49E-05	2.27E-02	98.7	2.02E-05	3.62E-05
^{59}Ni	5.77E-06	3.75E-03	16.3	4.19E-06	6.26E-06
^{63}Ni	5.71E-04	0.372	1.62E+03	4.13E-04	6.21E-04
^{60}Co	4.46E-05	2.91E-02	126	2.79E-05	4.80E-05
^{79}Se	6.24E-06	4.07E-03	17.7	4.89E-06	7.30E-06
^{90}Sr	0.360	234	1.02E+06	0.313	0.369
^{90}Y	0.360	234	1.02E+06	0.313	0.369
^{93}Zr	2.95E-05	1.92E-02	83.4	2.27E-05	3.48E-05
^{93m}Nb	2.22E-05	1.44E-02	62.8	1.74E-05	2.59E-05
^{99}Tc	2.66E-04	0.173	753	2.07E-04	3.51E-04
^{106}Ru	2.34E-08	1.52E-05	6.62E-02	2.00E-08	2.48E-08
^{113m}Cd	1.34E-04	8.76E-02	381	1.05E-04	1.63E-04

Table A3-2. Historical Tank Inventory Estimate.[1] (4 sheets)

Single-Shell Tank 241-AX-101					
Total Inventory Estimate[1]					
Radiological Constituents (Cont'd)	Ci/L	μCi/g	Ci	-95 CI (Ci/L)	+95 CI (Ci/L)
^{125}Sb	2.01E-04	0.131	568	1.26E-04	2.15E-04
^{126}Sn	9.63E-06	6.27E-03	27.3	7.60E-06	1.12E-05
^{129}I	5.14E-07	3.35E-04	1.45	4.00E-07	6.80E-07
^{134}Cs	3.99E-06	2.60E-03	11.3	2.33E-06	5.68E-06
^{137}Cs	0.266	173	7.54E+05	0.234	0.308
^{137m}Ba	0.252	164	7.13E+05	0.205	0.281
^{151}Sm	2.26E-02	14.7	6.39E+04	1.78E-02	2.63E-02
^{152}Eu	7.56E-06	4.93E-03	21.4	6.38E-06	8.77E-06
^{154}Eu	8.14E-04	0.530	2.30E+03	5.80E-04	9.57E-04
^{155}Eu	4.80E-04	0.313	1.36E+03	4.08E-04	5.54E-04
^{226}Ra	3.91E-10	2.55E-07	1.11E-03	3.49E-10	4.24E-10
^{228}Ra	3.59E-07	2.34E-04	1.02	9.39E-08	4.28E-07
^{227}Ac	2.18E-09	1.42E-06	6.17E-03	1.94E-09	2.37E-09
^{231}Pa	6.34E-09	4.13E-06	1.80E-02	5.16E-09	7.40E-09
^{229}Th	8.32E-09	5.42E-06	2.35E-02	2.20E-09	9.83E-09
^{232}Th	3.88E-08	2.53E-05	0.110	6.06E-09	5.63E-08
^{232}U	1.06E-06	6.90E-04	3.00	8.12E-07	1.41E-06
^{233}U	4.06E-06	2.65E-03	11.5	3.11E-06	5.41E-06
^{234}U	6.50E-07	4.24E-04	1.84	6.30E-07	6.66E-07
^{235}U	2.57E-08	1.68E-05	7.29E-02	2.49E-08	2.64E-08
^{236}U-236	2.10E-08	1.37E-05	5.94E-02	2.04E-08	2.15E-08
^{238}U	9.10E-07	5.93E-04	2.58	8.91E-07	9.51E-07
^{237}Np	9.20E-07	5.99E-04	2.60	7.29E-07	1.20E-06
^{238}Pu	4.56E-06	2.97E-03	12.9	3.90E-06	4.77E-06
^{239}Pu	1.30E-04	8.46E-02	368	1.12E-04	1.35E-04
^{240}Pu	2.37E-05	1.54E-02	67.1	2.05E-05	2.47E-05
^{241}Pu	3.21E-04	0.209	910	2.75E-04	3.36E-04
^{242}Pu	1.84E-09	1.20E-06	5.22E-03	1.57E-09	1.93E-09

Table A3-2. Historical Tank Inventory Estimate.[1] (4 sheets)

Single-Shell Tank 241-AX-101					
Total Inventory Estimate[1]					
^{241}Am	1.65E-04	0.107	466	1.44E-04	1.81E-04
^{243}Am	6.74E-09	4.39E-06	1.91E-02	5.95E-09	7.20E-09
^{242}Cm	2.48E-07	1.62E-04	0.703	2.01E-07	2.94E-07
^{243}Cm	2.22E-08	1.45E-05	6.28E-02	1.77E-08	2.63E-08
^{244}Cm	4.04E-07	2.63E-04	1.15	3.37E-07	4.30E-07
Totals	***M***	**μg/g**	**kg**	**-95 CI (*M* or g/L)**	**+95 CI (*M* or g/L)**
Pu	1.93E-03 (g/L)	----	5.47	1.64E-03	2.03E-03
U	7.28E-03	1.13E+03	4.91E+03	7.04E-03	7.47E-03

Notes:

CI = confidence interval

[1]Historical tank content estimates predictions have not been validated and should be used with caution.
[2]Unknowns in tank solids inventory are assigned by the TLM.
[3]Volume average for density, mass average water wt% and TOC wt% C.

A4.0 SURVEILLANCE DATA

Tank 241-AX-101 surveillance consists of surface-level measurements (liquid and solid) and temperature monitoring inside the tank (waste and headspace) and leak detection well (dry well) monitoring for radioactivity outside the tank. Surveillance data provide the basis for determining tank integrity.

Liquid-level measurements can indicate whether the tank has a major leak. Solid surface-level measurements indicate physical changes in and consistencies of the solid layers of a tank. Dry wells located around the tank perimeter may show increased radioactivity due to leaks.

A4.1 SURFACE-LEVEL READINGS

An automatic Food Instrument Corporation gauge set in intrusion mode was used to monitor the surface level through riser 8C from January 1981 to September 1995. Currently an ENRAF[1] gauge has replaced the Food Instrument Corporation gauge. Surface level readings have been relatively steady at 704 cm (277 in) since 1981. Manual ENRAF™ readings from March 31, 1997, to March 31, 1998, ranged from 703.5 cm (276.95 in.) to 705.2 (277.6 in.). Figure A4-1 is a level history graph of the surface level instruments.

Tank 241-AX-101 has a liquid observation well located in riser 9A. The interstitial liquid level was monitored using a neutron probe in July 1997 with a gamma probe from October 1984 to February 1998. The interstitial liquid level on February 23, 1998, was 359.4 cm (11.79 ft) using the gamma probe.

Tank 241-AX-101 has eight dry wells. Dry wells 11-01-04, 11-01-05, 11-01-09 and 11-01-10 have current readings less than 200 counts per second, but greater than background readings of 50 counts per second.

A4.2 INTERNAL TANK TEMPERATURES

Tank 241-AX-101 has a single thermocouple tree with 18 thermocouples to monitor the waste temperature through riser 9B (Tran 1993). Figure A4-2 is a graph of the weekly high temperature from November 1975 to November 1998. As shown in the figure, the tank temperature has gradually decreased over time. From March 31, 1997, to March 31, 1998, the minimum tank temperature was 24.2°C (75.5°F), and the maximum was 55.8°C (132.5 °F).

A4.3 TANK 241-AX-101 PHOTOGRAPHS

The clearest and most recent set of interior tank photographs was taken on August 18, 1987. Other interior tank photographs are available, but only the photographs showing the waste surface were used to create a montage. The montage shows a yellow-grey to grey saltcake surface with no liquid. A heating coil used to keep waste from cooling too quickly is visible in the montage, also a typical airlift circulator. An old level measurement tape is visible on the surface near riser 6. Because no waste transfers have occurred since the photographs were taken, the montage should be representative of the current tank surface. The montage is shown in Appendix G of Brevick et al. (1997).

[1]ENRAF is a trademark of ENRAF Corporation, Houston, Texas.

Figure A4-1. Tank 241-AX-101 Level History.

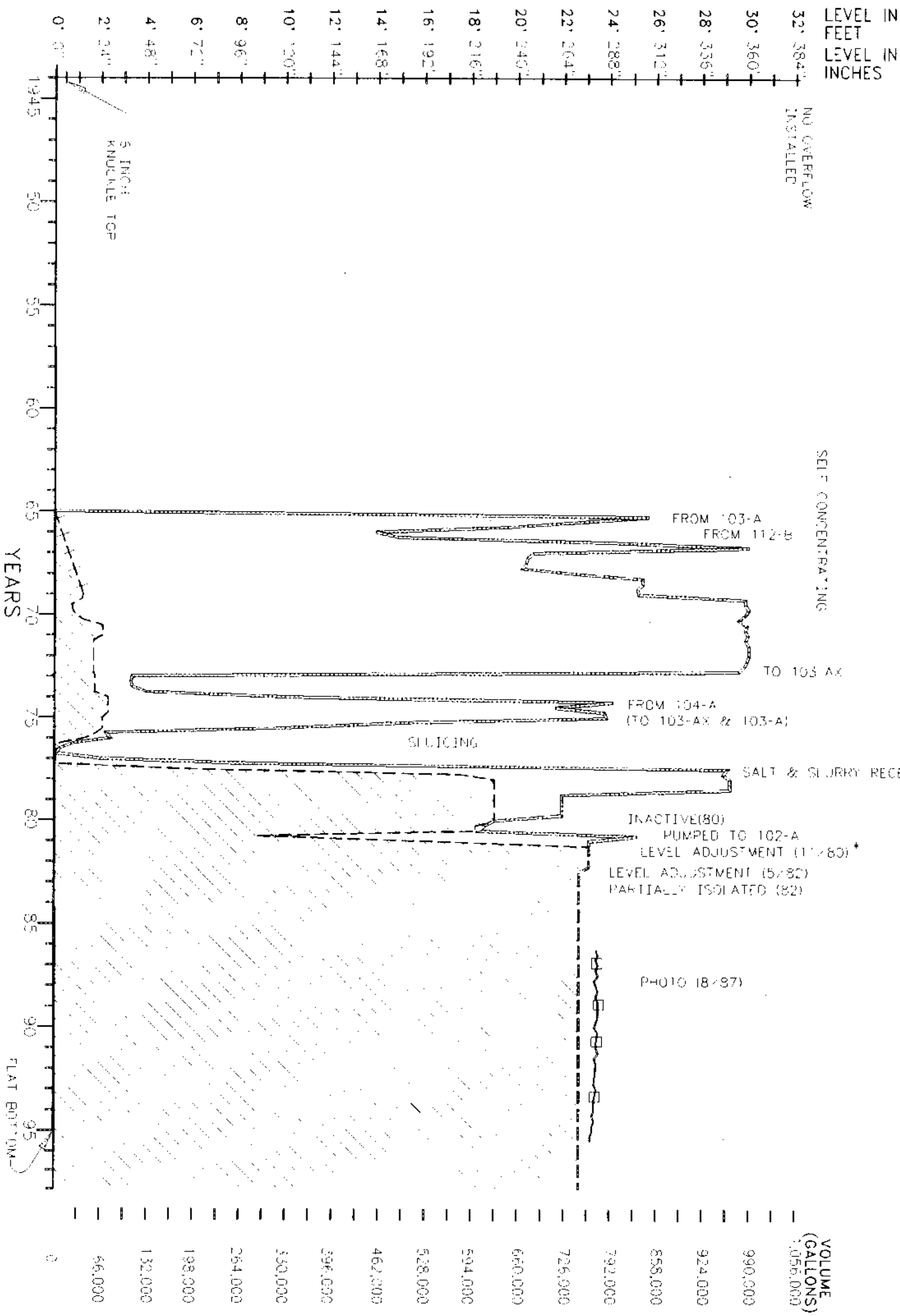
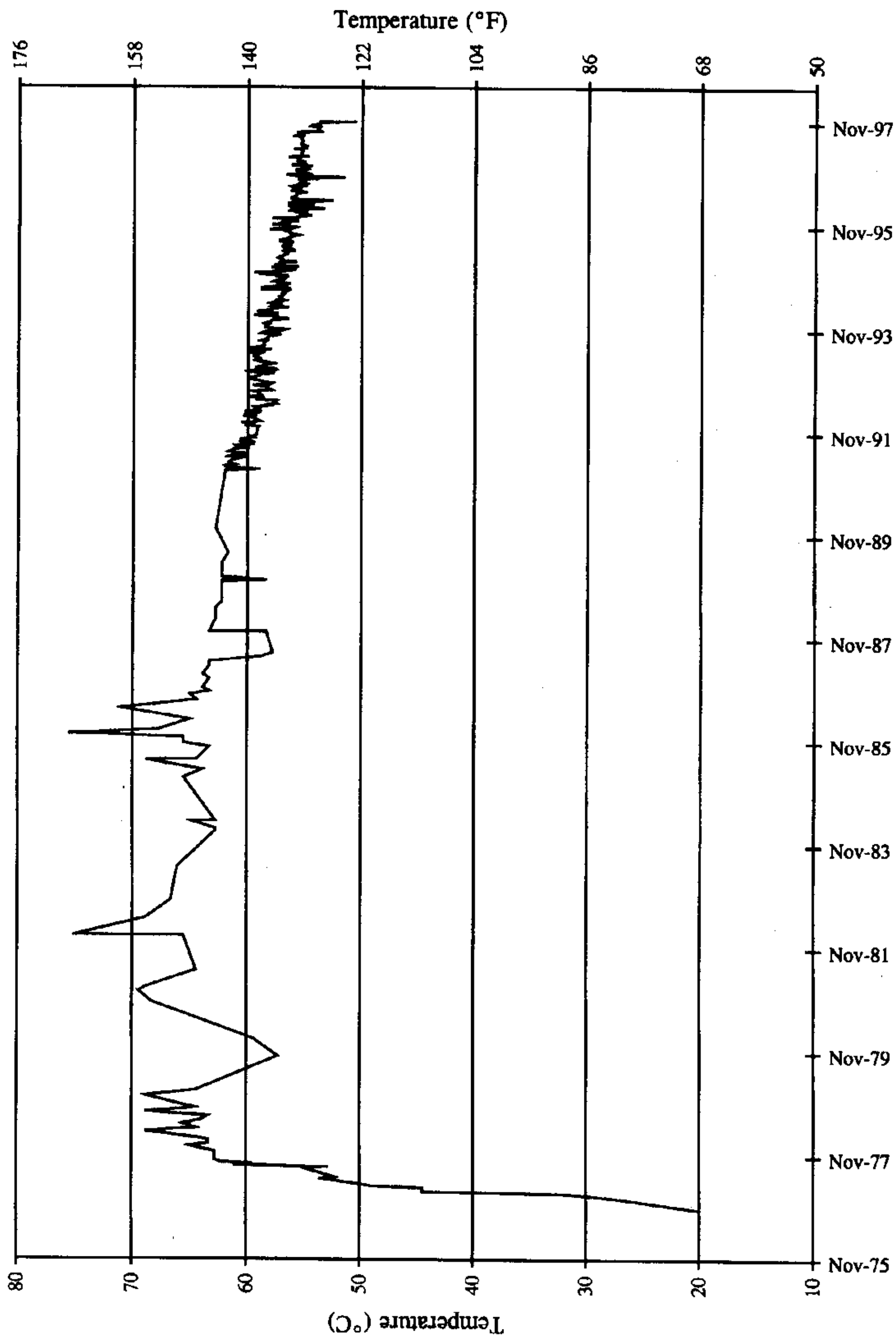


Figure A4-2. Tank 241-AX-101 High Temperature Plot.



A5.0 APPENDIX A REFERENCES

Agnew, S. F., J. Boyer, R. A. Corbin, T. B. Duran, J. R. Fitzpatrick, K. A. Jurgensen, T. P. Ortiz, and B. L. Young, 1997a, *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4*, LA-UR-96-3860, Rev. 0, Los Alamos National Laboratory, Los Alamos, New Mexico.

Agnew, S. F., P. Baca, R. A. Corbin, T. B. Duran, and K. A. Jurgensen, 1997b, *Waste Status and Transaction Record Summary (WSTRS) Rev. 4*, LA-UR-97-311, Rev. 0, Los Alamos National Laboratory, Los Alamos, New Mexico.

Alstad, A. T., 1993, *Riser Configuration Document for Single-Shell Waste Tanks*, WHC-SD-RE-TI-053, Rev. 9, Westinghouse Hanford Company, Richland, Washington.

Anderson, J. D., 1990, *A History of the 200 Area Farms*, WHC-MR-0132, Westinghouse Hanford Company, Richland, Washington.,

ARCHO, 1976a, *Dome Plan,* H-2-44560, Rev. 6, Atlantic Richfield Company Hanford, Richland, Washington.

ARCHO, 1976b, *101-AX Tank Arrangement As Built*, H-2-68237, Rev. 1, Atlantic Richfield Company Hanford, Richland, Washington.

Brevick, C. H., J. L. Stroup, and J. W. Funk, 1997, *Supporting Document for the Historical Tank Content Estimate for the AX-Tank Farm*, HNF-SD-WM-ER-309, Rev. 1B, Fluor Daniel Northwest, Inc., for Fluor Daniel Hanford, Inc., Richland, Washington.

Hanlon, B. M., 1998, *Waste Tank Summary Report for Month Ending March 31, 1998*, HNF-EP-0182-120, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

HAPO, 1975, *Structual Waste Storage Tanks Composite Section and Details*, H-2-44562, Rev. 4, Hanford Atomic Products Operations (General Electric at the Hanford Site), Richland, Washington.

Leach, C. E., and S. M. Stahl, 1997, *Hanford Site Tank Farm Facilities Interim Safety Basis*, WHC-SD-WM-ISB-001, Rev. 0M, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

Lipnicki, J., 1997, *Waste Tank Risers Available for Sampling*, HNF-SD-WM-TI-710, Rev. 4, Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

Public Law 101-510, 1990, "Safety Measures for Waste Tanks at Hanford Nuclear Reservation," Section 3137 of *National Defense Authorization Act for Fiscal Year 1991*.

Tran, T. T., 1993, *Thermocouple Status Single-Shell & Double-Shell Waste Tanks*, WHC-SD-WM-TI-553, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

VITRO, 1977, *Civil Plot Plan and Finish Grading*, H-2-69148, Rev. 1, VITRO Engineering Corporation, Richland, Washington.

VITRO, 1988, *Piping Waste Isolation 241-AX-101*, H-2-73376, Rev. 4, VITRO Engineering Corporation, Richland, Washington.

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APPENDIX B

SAMPLING OF TANK 241-AX-101

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APPENDIX B

SAMPLING OF TANK 241-AX-101

Appendix B provides sampling and analysis information for each known sampling event for tank 241-AX-101 and assesses sample results. It includes the following.

- **Section B1.0**: Tank Sampling Overview
- **Section B2.0**: Sampling Events
- **Section B3.0**: Assessment of Characterization Results
- **Section B4.0**: Appendix B References.

B1.0 TANK SAMPLING OVERVIEW

This section describes the January/February 1998 core sampling and analysis, the July 1997 grab sampling and analysis, and the June 1995 vapor sampling and analysis events for tank 241-AX-101.

Push mode core samples were taken in January/February 1998 to satisfy the requirements of the *Tank Safety Screening Data Quality Objective* (Dukelow et al. 1995), *Data Quality Objective to Support Resolution of the Flammable Gas Safety Issue* (Bauer and Jackson 1998), *Memorandum of Understanding for the Organic Complexant Safety Issue Data Requirements* (Schreiber 1997), and *Historical Model Evaluation Data Requirements* (Simpson and McCain 1997). Sampling and analyses were performed in accordance with the *Tank 241-AX-101 Push Core Sampling and Analysis Plan* (Field 1997).

Three grab samples were taken in July 1997 to satisfy requirements for *Data Quality Objectives for Tank Farms Waste Compatibility Program* (Fowler 1995). Currently, the applicable compatibility documents are Mulkey and Miller (1997) and Fowler (1995). Sampling and analyses were performed in accordance with the *Compatibility Grab Sample and Analysis Plan* (Sasaki 1997).

Vapor samples were taken June 1995 to satisfy the *Data Quality Objective to Support Resolution of the Organic Solvent Safety Issue* (Meacham et al. 1997) and *Hazardous Vapor Safety Screening* (Osborne and Buckley 1995). Sampling and analysis were performed in accordance with the vapor sampling and analysis plan (Homi 1995).

B2.0 SAMPLING EVENTS

This section describes sampling events.

B2.1 1998 CORE SAMPLING EVENT

Safety screening analyses included total alpha to determine criticality, DSC to ascertain the fuel energy value, TGA to obtain the total moisture content, bulk density, and combustible gas meter readings in the tank headspace to measure flammability.

Tank 241-AX-101 also was evaluated against the historical model requirements and organic complexant issues. The specified gateway analytes to evaluate the TLM for this tank are sodium, nitrate, fluoride, and phosphate.

Table B2-1. Integrated Data Quality Objective Requirements for Tank 241-AX-101.[1] (2 sheets)

Sampling Event	Applicable DQOs	Sampling Requirements	Analytical Requirements
Push mode core sampling	Safety screening - Energetics - Moisture content - Total alpha - Flammable gas Dukelow et al. (1995) Flammable gas Bauer and Jackson (1998) Organic complexants Schreiber (1997) Historical Simpson and McCain (1997)	Core samples from a minimum of two risers separated radially to the maximum extent possible. Combustible gas measurement	Flammability, energetics, moisture, total alpha activity, density, anions, cations, radionuclides, TOC, separable organics, physical properties, TIC, pH, Cr(VI)
Grab sampling	Compatibility Mulkey and Miller (1997) Fowler (1995)	Grab samples	Energetics, moisture, anions, cations, radionuclides, specific gravity, pH, separable organics, TOC, TIC, percent solids

Table B2-1. Integrated Data Quality Objective Requirements for Tank 241-AX-101.[1] (2 sheets)

Sampling Event	Applicable DQOs	Sampling Requirements	Analytical Requirements
Vapor sampling	Organic solvents Meacham et al. (1997)	Steel canisters, triple sorbent traps, sorbent trap systems	Flammable gas, organic vapors, permanent gases

Note:
[1]Field (1997)

B2.1.1 Sample Handling

Fifteen push mode core segments were removed from tank 241-AX-101, riser 9D (core 226) between January 8 and January 16, 1998. Because a hard layer was encountered at segment 15, only 2 in. of solids were pushed and recovered. A problem, encountered while removing segment 15 from the drill string, caused a four-week delay in the shipment of this segment to the laboratory. Segments were received by the 222-S Laboratory and extruded between January 12 and February 19, 1998. The subsequent sampling of the second core was also delayed. A selected segment, 8, was sampled using the retained gas sampler (RGS) and was extruded by the Process Chemistry and Statistical Analysis Group. Segment 11 is designated as a retake (11R) for core 226. However, only one sample was sent to the laboratory for segment 11 (Esch 1998).

A lithium bromide solution was used during sampling for each segment in core 226 and core 228. Also, 300 mL of 0.02*M* NH_4OH was added to the retained gas sample for segment 8 of core 226 during extraction. The resulting sample was centrifuged and separated into solid and liquid fractions for analysis.

Fifteen push mode core segments were also removed from riser 9G (core 228) between February 3 and February 13, 1998. A hard layer was encountered preventing pushing segment 15. However, 5 in. of solids were still recovered for segment 15. The samples were received by the 222-S Laboratory and were extruded between February 13 and February 25, 1998.

Samples were assigned LABCORE numbers and were visually inspected for color, clarity, and solids content. The radiation dose rate on contact also was measured. Drainable liquid (and liner liquid when present in sufficient amount) was collected and clarified by centrifugation. Segments containing solids were divided into upper and lower half segments. Core composites were created and analyzed for the historical DQO (Simpson and McCain 1997).

In addition to segment samples, a field blank obtained during the sampling operation and a lithium bromide blank were sent to the 222-S Laboratory for analysis.

Table B2-2 shows sample extrusion and subsampling results.

B2.1.2 Sample Analysis

Samples and subsamples from core 226 and core 228 were analyzed based on safety screening, organic, flammable gas and historical issues. Analyses included total alpha activity, energetics, water content, flammable gas, TOC, total inorganic carbon (TIC), bulk density, IC (ion chromatography), ICP (inductively coupled plasma) spectroscopy, and gamma energy analysis (GEA). Samples were separated for analysis at the half-segment level where both drainable liquid and solids were present.

Solids analyses were performed by the laboratory on homogenized samples, and liquids were measured directly. Weight percent water was determined by thermogravimetric analysis (TGA). The fuel content of the waste was determined by differential scanning calorimetry (DSC). Metals were measured using ICP. Before analysis, the subsamples were prepared by both a fusion and an acid digestion. Anions were measured on water-leached samples using IC. Total organic carbon was measured using hot persulfate oxidation and coulometry. Total alpha activity and gamma energy analyses were performed on fusion-digested samples. Density was measured using centrifugation. Table B2-2 provides further information regarding the various laboratory procedures used in the analysis of these samples. Composite samples were prepared and analyzed for core 226 and 228.

Table B2-3 lists the approved analytical procedures used for reported analyses. Table B2-4 summarizes the sample portions, sample numbers, and analyses performed on each sample.

Table B2-2. Sample Receipt and Extrusion Information for 241-AX-101. (5 sheets)

Sample Id	Core: Segment	Inches Extruded[1]	Liquid Recovered (g)	Solids Recovered (g)	Sample Description
226-01	226:1	3	25.0	64.76 - Lower	Solids were white, gray, and black specked and resembled dry salt. Drainable liquid was yellowish brown and opaque. No organic layer observed.
226-02	226:2	18	None	199.49 - Upper 192.30 - Lower	Solids were gray and resembled moist salt. No drainable liquid. X-ray showed gas in sample.
226-03	226:3	18	None	192.1 - Upper 226.8 - Lower	Solids were gray and resembled moist salt with a pitted surface. No drainable liquid. X-ray showed gas in sample.
226-04	226:4	18	None	211.5 - Upper 214.4 - Lower	Solids were gray and resembled moist salt with a pitted surface except at the top of the upper half. Upper half solids appeared more moist than lower half solids. No drainable liquid collected. X-ray showed 17 in. sample.
226-05	226:5	18	None	211.2 - Upper 218.5 - Lower	Solids were gray and resembled moist salt with a pitted surface, more moist than previous segments. No drainable liquid. X-ray showed 17.5 in. sample.
226-06	226:6	19	None	227.1 - Upper 227.0 - Lower	Solids were gray and resembled moist salt with a pitted surface. No drainable liquid.
226-07	226:7	19	None	218.9 - Upper 208.1 - Lower	Solids were gray and resembled moist salt with a pitted surface, drier than previous segments. No drainable liquid.
226-08	226:8	n/a	n/a	n/a	Sampled using RGS. 300 mL of 0.2*M* ammonium hydroxide added during extraction.
226-09	226:9	18	22.6 Liner	205.2 - Upper 249.4 - Lower	Solids were gray and resembled moist salt with a pitted surface. No drainable liquid. Liner liquid not analyzed. X-ray showed bubbles in sample.

Table B2-2. Sample Receipt and Extrusion Information for 241-AX-101. (5 sheets)

Sample Id	Core: Segment	Inches Extruded[1]	Liquid Recovered (g)	Solids Recovered (g)	Sample Description
226-10	226:10	18	None	216.6 - Upper 221.6 - Lower	Solids were gray and resembled moist salt with a pitted surface, more moist than previous segments. No drainable liquid.
226-11R	226:11R	6	190.6	80.8 - Upper 65.0 - Lower	Upper half solids were mostly white and resembled salt slurry. Lower half solids were white and resembled salt slurry. Drainable liquid was light yellow and opaque. No organic layer observed. 20 to 25 mL of white solids settled in liquid.
226-12	226:12	7	233.4	96.2 - Upper 71.1 - Lower	Upper half solids were mostly white and resembled salt slurry. Lower half solids were white and resembled salt slurry. Drainable liquid was light yellow and opaque. No organic layer observed. Approximately 20 mL of white solids settled in liquid.
226-13	226:13	5	295.4	118.5 -Whole	Solids were white to slightly gray and resembled salt slurry. Drainable liquid was light yellow and opaque. No organic layer observed. 20 to 30 mL of white solids settled in liquid.
226-14	226:14	7	173.7	87.4 - Upper 166.5 - Lower	Upper half solids (approximately 2 in.) were mixed white and dark gray salt slurry, some black specks. Some hard white crystals observed. Lower half solids were mostly white salt slurry, a few black specks. Salt crystals were hard (difficult to crush with a spatula). Drainable liquid was light yellow and opaque. No organic layer observed.

Table B2-2. Sample Receipt and Extrusion Information for 241-AX-101. (5 sheets)

Sample Id	Core: Segment	Inches Extruded[1]	Liquid Recovered (g)	Solids Recovered (g)	Sample Description
226-15	226:15	2	38.3	29.0 - Lower	Solids were white and resembled salt slurry with black specks. Drainable liquid was light yellow and opaque. No organic layer observed. This segment was difficult to remove from the drill string.
228-01	228:1	0	23.6 Liner	None	No solids. Liner liquid was gray/tan and opaque. No organic layer.
228-02	228:2	16	None	186.9 - Upper 173.1 - Lower	Solids were gray and resembled moist salt with a pitted surface. One hard black chunk approximately 0.5 in. dia. In upper half. No drainable liquid. X-ray showed 14 in. sample.
228-03	228:3	19	None	214.6 - Upper 202.8 - Lower	Solids were gray and resembled moist salt with a pitted surface No drainable liquid.
228-04	228:4	19	None	232.2 - Upper 204.8 - Lower	Solids were gray and resembled moist salt with a pitted surface. No drainable liquid.
228-05	228:5	19	None	191.9 - Upper 221.6 - Lower	Solids were gray and resembled moist salt with a pitted surface. No drainable liquid.
228-06	228:6	18	None	228.9 - Upper 194.2 - Lower	Solids were gray and resembled moist salt with a pitted surface and a few white crystalline flakes. No drainable liquid.
228-07	228:7	5	123.2- Liner 31.8- Drainable	136.7 - Upper 123.2 - Lower	Solids were mostly gray and resembled wet salt. Liner liquid was cloudy yellow/gray and contained about 30 mL of settled gray solids. Solid and liquid portions were separated by centrifugation. Drainable liquid was gray and opaque. No organic layer observed.

Table B2-2. Sample Receipt and Extrusion Information for 241-AX-101. (5 sheets)

Sample Id	Core: Segment	Inches Extruded[1]	Liquid Recovered (g)	Solids Recovered (g)	Sample Description
228-08	228:8	19	n/a	214.4 - Upper 223.6 - Lower	Solids were gray with white crystalline material and resembled moist salt with pitted surface. <5 mL of drainable liquid.
228-09	228:9	19	None	213.6 - Upper 235.4 - Lower	Solids were gray and resembled moist salt with a pitted surface. No drainable liquid. X-ray showed full sampler with voids throughout sample.
228-10	228:10	4	251.6	143.7 - Lower	Solids were blue/gray and resembled salt slurry with some white crystalline solids intermixed. Drainable liquid was blue/gray and opaque. No organic layer was observed. X-ray showed 18 in. thick soupy sample.
228-11	228:11	4	237.1	143.9 - Lower	Solids were white and resembled salt slurry. Drainable liquid was yellow and clear. No organic layer was observed.
228-12	228:12	5	271.5	155.2 - Lower	Solids were white and resembled salt slurry. Drainable liquid was yellow and clear. No organic layer was observed.
228-13	228:13	5	266.1	158.7 - Lower	Solids were white and resembled salt slurry. Drainable liquid was yellow and clear. No organic layer was observed. X-ray showed full sampler.

Table B2-2. Sample Receipt and Extrusion Information for 241-AX-101. (5 sheets)

Sample Id	Core: Segment	Inches Extruded[1]	Liquid Recovered (g)	Solids Recovered (g)	Sample Description
228-14	228:14	3	230.3	113.3 - Lower	Solids were white and gray and resembled salt slurry. Drainable liquid was yellow and clear. No organic layer was observed. X-ray showed full sampler with dense material.
228-15	228:15	5	234.1	138.2 - Lower	Solids were pale yellow and resembled salt slurry. Drainable liquid was yellow and clear. No organic layer was observed. X-ray showed full sampler.

Note:

[1]Approximate inches extruded

Table B2-3. Analytical Procedures[1].

Analysis	Method	Procedure Number
Energetics	Differential scanning calorimeter	LA-514-114
Percent water	Thermogravimetric analysis	LA-514-114
Total alpha activity	Alpha proportional counter	LA-508-101
Flammable gas	Combustible gas analyzer	WHC-IP-0030 IH 1.4 and IH-2.1[2]
TOC/TIC	Persulfate oxidation and coulometry	LA-342-100
Metals by ICP/AES	Inductively coupled plasma spectrometer	LA-505-161
Anions by IC	Ion chromatograph	LA-533-105
Radionuclides	Gamma energy analysis	LA-548-121
Uranium	Kinetic phosphorescence	LA-925-009
^{90}Sr	Beta proportional counter	LA-220-101
Total beta activity	Beta proportional counter	LA-508-101
Bulk density	Gravimetry	LO-160-103 LA-519-132
Specific gravity	Gravimetry	LA-510-112
TOC	Furnace oxidation and coulometry	LA-344-105

Notes:

[1]Esch (1998)
[2]WHC (1992)

Table B2-4. Tank 241-AX-101 Sample Analysis Summary. (10 sheets)

Riser	Sample Identification	Sample Portion	Sample Number	Analyses
9D	Core 226, segment 1	Whole	S98T000083	Bulk density
		Drainable liquid	S98T000090	TIC/TOC, specific gravity, ICP, IC, DSC/TGA, alpha
		Lower sample	S98T000085	TIC/TOC, DSC/TGA
			S98T000087	GEA, alpha
			S98T000088	ICP
			S98T000089	IC
	Core 226, segment 2	Upper sample	S98T000093	TIC/TOC, DSC/TGA
			S98T000094	GEA
			S98T000095	ICP
			S98T000096	IC
		Lower sample	S98T000092	Bulk density
			S98T000097	TIC/TOC, DSC/TGA
			S98T000098	GEA, alpha
			S98T000099	ICP
			S98T000100	IC
	Core 226, segment 3	Upper sample	S98T000105	TIC/TOC, DSC/TGA
			S98T000121	GEA
			S98T000127	ICP
			S98T000133	IC
		Lower sample	S98T000104	Bulk density
			S98T000106	TIC/TOC, DSC/TGA
			S98T000122	GEA, alpha
			S98T000128	ICP
			S98T000134	IC
	Core 226, segment 4	Upper sample	S98T000107	TIC/TOC, DSC/TGA
			S98T000123	GEA
			S98T000129	ICP
			S98T000135	IC

Table B2-4. Tank 241-AX-101 Sample Analysis Summary. (10 sheets)

Riser	Sample Identification	Sample Portion	Sample Number	Analyses
9D	Core 226, segment 4 (Cont'd)	Lower sample	S98T000108	TIC/TOC, DSC/TGA
			S98T000112	Bulk density
			S98T000124	GEA, alpha
			S98T000130	ICP
			S98T000136	IC
	Core 226, segment 5	Upper sample	S98T000109	TIC/TOC, DSC/TGA
			S98T000125	U, Sr, GEA, total beta
			S98T000131	ICP
			S98T000137	IC
			S98T000731	ICP
		Lower sample	S98T000110	TIC/TOC, DSC/TGA
			S98T000114	Bulk density
			S98T000126	U, Sr, GEA, alpha, total beta
			S98T000132	ICP
			S98T000138	IC
			S98T000732	ICP
	Core 226, segment 6	Upper sample	S98T000147	TIC/TOC, DSC/TGA
			S98T000155	GEA
			S98T000159	ICP
			S98T000163	IC
		Lower sample	S98T000144	Bulk density
			S98T000148	TIC/TOC, DSC/TGA
			S98T000156	GEA, alpha
			S98T000160	ICP
			S98T000164	IC
	Core 226, segment 7	Upper sample	S98T000149	TIC/TOC, DSC/TGA
			S98T000157	GEA
			S98T000161	ICP
			S98T000165	IC

Table B2-4. Tank 241-AX-101 Sample Analysis Summary. (10 sheets)

Riser	Sample Identification	Sample Portion	Sample Number	Analyses
9D	Core 226, segment 7 (Cont'd)	Lower sample	S98T000146	Bulk density
			S98T000150	TIC/TOC, DSC/TGA
			S98T000158	GEA, alpha
			S98T000162	ICP
			S98T000166	IC
	Core 226, segment 8	Whole RGS sample	S98T001002	TIC/TOC, DSC/TGA
			S98T001004	GEA, alpha
			S98T001005	ICP
			S98T001006	IC
		Drainable liquid (filtered)	S98T001008	DSC/TGA, DSC, alpha
			S98T001009	TIC/TOC, specific gravity, ICP, IC
	Core 226, segment 9	Upper sample	S98T000227	TIC/TOC, DSC/TGA, DSC
			S98T000228	GEA
			S98T000229	ICP
			S98T000230	IC
		Lower sample	S98T000226	Bulk density
			S98T000242	TIC/TOC, DSC/TGA
			S98T000243	GEA, alpha
			S98T000244	ICP
			S98T000245	IC
	Core 226, segment 10	Upper sample	S98T000246	TIC/TOC, DSC/TGA
			S98T000264	GEA
			S98T000273	ICP
			S98T000282	IC
		Lower sample	S98T000236	Bulk density
			S98T000250	TIC/TOC, DSC/TGA
			S98T000268	GEA, alpha
			S98T000277	ICP
			S98T000286	IC

Table B2-4. Tank 241-AX-101 Sample Analysis Summary. (10 sheets)

Riser	Sample Identification	Sample Portion	Sample Number	Analyses
9D	Core 226, segment 11R	Drainable liquid	S98T000294	DSC/TGA, alpha
			S98T000295	TIC/TOC, specific gravity, ICP, IC
		Upper sample	S98T000247	TIC/TOC, DSC/TGA
			S98T000265	U, Sr, GEA, total beta
			S98T000274	ICP
			S98T000283	IC
			S98T000733	ICP
		Lower sample	S98T000237	Bulk density
			S98T000251	TIC/TOC, DSC/TGA
			S98T000269	U, Sr, GEA, alpha, total beta
			S98T000278	ICP
			S98T000287	IC
			S98T000734	ICP
	Core 226, segment 12	Drainable liquid	S98T000300	DSC/TGA, DSC, alpha
			S98T000303	TIC/TOC, specific gravity, ICP, IC
		Upper sample	S98T000248	TIC/TOC, DSC/TGA
			S98T000266	GEA
			S98T000275	ICP
			S98T000284	IC
		Lower sample	S98T000238	Bulk density
			S98T000252	TIC/TOC, DSC/TGA
			S98T000270	GEA, alpha
			S98T000279	ICP
			S98T000288	IC, furnace oxidation
	Core 226, segment 13	Whole	S98T000239	Bulk density
			S98T000253	TIC/TOC, DSC/TGA
			S98T000271	GEA, alpha
			S98T000280	ICP
			S98T000289	IC

Table B2-4. Tank 241-AX-101 Sample Analysis Summary. (10 sheets)

Riser	Sample Identification	Sample Portion	Sample Number	Analyses
9D	Core 226, segment 13 (Cont'd)	Drainable liquid	S98T000301	DSC/TGA, DSC, alpha
			S98T000304	TIC/TOC, specific gravity, ICP, IC, furnace oxidation (TOC)
	Core 226, segment 14	Drainable liquid	S98T000302	DSC/TGA, DSC, alpha
			S98T000305	TIC/TOC, specific gravity, ICP, IC, furnace oxidation (TOC)
		Upper sample	S98T000249	TIC/TOC, DSC/TGA
			S98T000267	GEA
			S98T000276	ICP
			S98T000285	IC
		Lower sample	S98T000240	Bulk density
			S98T000254	TIC/TOC, DSC/TGA
			S98T000272	U, Sr, GEA, alpha, total beta
			S98T000281	ICP
			S98T000290	IC
			S98T000735	ICP
	Core 226, segment 15	Drainable liquid	S98T000514	TIC/TOC, specific gravity, ICP, IC, Furnace Oxidation (TOC), DSC/TGA, alpha
		Lower sample	S98T000506	Bulk density
			S98T000507	TIC/TOC, DSC/TGA
			S98T000509	GEA, alpha
			S98T000510	ICP
			S98T000511	IC
		Core composite	S98T000664	Bulk density
			S98T000670	TIC/TOC, DSC/TGA
			S98T000674	U, Sr, GEA, alpha, total beta
			S98T000675	ICP
			S98T000676	IC
			S98T000729	ICP

Table B2-4. Tank 241-AX-101 Sample Analysis Summary. (10 sheets)

Riser	Sample Identification	Sample Portion	Sample Number	Analyses
9G	Core 228, segment 1	Liner liquid	S98T000568	TIC/TOC, ICP, IC
	Core 228, segment 2	Upper sample	S98T000526	TIC/TOC, DSC/TGA
			S98T000538	GEA
			S98T000544	ICP
			S98T000550	IC
		Lower sample	S98T000521	Bulk density
			S98T000527	TIC/TOC, DSC/TGA
			S98T000539	GEA, alpha
			S98T000545	ICP
			S98T000551	IC, furnace oxidation
	Core 228, segment 3	Upper sample	S98T000524	TIC/TOC, DSC/TGA
			S98T000536	GEA
			S98T000542	ICP
			S98T000548	IC
		Lower sample	S98T000519	Bulk density
			S98T000525	TIC/TOC, DSC/TGA
			S98T000537	GEA, alpha
			S98T000543	ICP
			S98T000549	IC
	Core 228, segment 4	Upper sample	S98T000522	TIC/TOC, DSC/TGA
			S98T000534	GEA
			S98T000540	ICP
			S98T000546	IC
		Lower sample	S98T000517	Bulk density
			S98T000523	TIC/TOC, DSC/TGA
			S98T000535	GEA, alpha
			S98T000541	ICP
			S98T000547	IC

Table B2-4. Tank 241-AX-101 Sample Analysis Summary. (10 sheets)

Riser	Sample Identification	Sample Portion	Sample Number	Analyses
9G	Core 228, segment 5	Upper sample	S98T000573	TIC/TOC, DSC/TGA
			S98T000575	U, Sr, GEA, total beta
			S98T000576	ICP
			S98T000577	IC
			S98T000736	ICP
		Lower sample	S98T000578	Bulk density
			S98T000581	TIC/TOC, DSC/TGA
			S98T000590	U, Sr, GEA, alpha, total beta
			S98T000593	ICP
			S98T000596	IC
			S98T000737	ICP
	Core 228, segment 6	Upper sample	S98T000604	TIC/TOC, DSC/TGA
			S98T000606	GEA
			S98T000607	ICP
			S98T000608	IC
		Lower sample	S98T000609	Bulk density
			S98T000620	TIC/TOC, DSC/TGA
			S98T000625	GEA, alpha
			S98T000630	ICP
			S98T000635	IC
	Core 228, segment 7	Liner liquid	S98T000645	ICP, IC
		Solids in liner liquid	S98T000648	ICP
			S98T000650	IC
		Drainable liquid	S98T000652	TIC/TOC, specific gravity, ICP, IC, furnace oxidation (TOC), DSC/TGA

Table B2-4. Tank 241-AX-101 Sample Analysis Summary. (10 sheets)

Riser	Sample Identification	Sample Portion	Sample Number	Analyses
9G	Core 228, segment 7 (Cont'd)	Lower sample	S98T000610	Bulk density
			S98T000621	TIC/TOC, DSC/TGA
			S98T000626	GEA, alpha
			S98T000631	ICP
			S98T000636	IC
	Core 228, segment 8	Upper sample	S98T000622	TIC/TOC, DSC/TGA
			S98T000627	GEA
			S98T000632	ICP
			S98T000637	IC
		Lower sample	S98T000612	Bulk density
			S98T000623	TIC/TOC, DSC/TGA
			S98T000628	GEA, alpha
			S98T000633	ICP
			S98T000638	IC
	Core 228, segment 9	Upper sample	S98T000582	TIC/TOC, DSC/TGA
			S98T000591	GEA
			S98T000594	ICP
			S98T000597	IC
		Lower sample	S98T000580	Bulk density
			S98T000583	TIC/TOC, DSC/TGA
			S98T000592	GEA, alpha
			S98T000595	ICP
			S98T000598	IC
	Core 228, segment 10	Drainable liquid	S98T000658	TIC/TOC, specific gravity, ICP, IC
			S98T000659	DSC/TGA, alpha
		Lower sample	S98T000613	Bulk density
			S98T000624	TIC/TOC, DSC/TGA
			S98T000629	GEA, alpha
			S98T000634	ICP
			S98T000639	IC

Table B2-4. Tank 241-AX-101 Sample Analysis Summary. (10 sheets)

Riser	Sample Identification	Sample Portion	Sample Number	Analyses
9G	Core 228, segment 11	Drainable liquid	S98T000780	DSC/TGA, DSC, alpha
			S98T000781	TIC/TOC, specific gravity, ICP, IC, furnace oxidation (TOC)
		Lower sample	S98T000767	Bulk density
			S98T000768	TIC/TOC, DSC/TGA
			S98T000773	U, Sr, GEA, alpha, total beta
			S98T000774	ICP
			S98T000776	IC
			S98T000777	ICP
	Core 228, segment 12	Drainable liquid	S98T000808	DSC/TGA, alpha
			S98T000812	TIC/TOC, specific gravity, ICP, IC
		Lower sample	S98T000783	Bulk density
			S98T000787	TIC/TOC, DSC/TGA
			S98T000791	GEA, alpha
			S98T000795	ICP
			S98T000799	IC
	Core 228, segment 13	Drainable liquid	S98T000809	DSC/TGA, alpha
			S98T000813	TIC/TOC, specific gravity, ICP, IC
		Lower sample	S98T000784	Bulk density
			S98T000788	TIC/TOC, DSC/TGA
			S98T000792	GEA, alpha
			S98T000796	ICP
			S98T000800	IC
	Core 228, segment 14	Drainable liquid	S98T000810	DSC/TGA, alpha
			S98T000814	TIC/TOC, specific gravity, ICP, IC
		Lower sample	S98T000785	Bulk density
			S98T000789	TIC/TOC, DSC/TGA
			S98T000793	U, Sr, GEA, alpha, total beta
			S98T000797	ICP
			S98T000801	IC
			S98T000803	ICP

Table B2-4. Tank 241-AX-101 Sample Analysis Summary. (10 sheets)

Riser	Sample Identification	Sample Portion	Sample Number	Analyses
9G	Core 228, segment 15	Drainable liquid	S98T000811	DSC/TGA, alpha
			S98T000815	TIC/TOC, specific gravity, ICP, IC
		Lower sample	S98T000786	Bulk density
			S98T000790	TIC/TOC, DSC/TGA
			S98T000794	GEA, alpha
			S98T000798	ICP
			S98T000802	IC
		Core composite	S98T000994	Bulk density
			S98T000995	TIC/TOC, DSC/TGA
			S98T000997	U, Sr, GEA, alpha, total beta
			S98T000998	ICP
			S98T000999	IC
			S98T001000	ICP

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B2.1.3 Analytical Results

This section summarizes the sampling and analytical results associated with the January and February 1998 sampling and analysis of tank 241-AX-101. Table B2-5 shows the table numbers for analytical data. These results are documented in Esch (1998).

Table B2-5. Analytical Tables for January/February 1998 Core Results.

Analysis	Table Number
Inductively Coupled Plasma/Emission Spectroscopy	B2-17 to 53
Total Uranium	B2-54
Ion Chromatography	B2-55 to 62
Bulk Density	B2-63
Energetics by Differential Scanning Calorimetry	B2-64
Percent Water by Thermogravimetric Analysis	B2-65
Specific Gravity	B2-66
Total Alpha	B2-67 and 68
Total Beta	B2-69
Gamma Energy Analysis	B2-70 and 71
$^{89/90}Sr$	B2-72
Total Organic Carbon by Persulfate	B2-75
Total Organic Carbon by Furnace Oxidation	B2-73
Total Inorganic Carbon	B2-74

The quality control (QC) parameters assessed in conjunction with tank 241-AX-101 samples were standard recoveries, spike recoveries, duplicate analyses (relative percent differences [RPDs]), and blanks. The QC criteria are specified in the sampling and analysis plan (Field 1997). Sample and duplicate pairs, in which any QC parameter was outside these limits, are footnoted in the sample mean column of the following data summary tables with an a, b, c, d, e, or f as follows.

- "a" indicates the standard recovery was below the QC limit.
- "b" indicates the standard recovery was above the QC limit.
- "c" indicates the spike recovery was below the QC limit.
- "d" indicates the spike recovery was above the QC limit.
- "e" indicates the RPD was above the QC limit.
- "f" indicates blank contamination.

In the analytical tables, the "mean" is the average of the result and duplicate value. All values, including those below the detection level (<) were averaged. If both sample and duplicate values were nondetected or, if one value was detected and the other was not, the mean is expressed as a nondetected value. If both values were detected, the mean is expressed as a detected value.

B2.1.3.1 Total Alpha Activity. The total alpha analysis was performed in duplicate on lower half segment solids and drainable liquid subsamples. Direct sample aliquots were analyzed for the drainable liquids. The analysis of the solids was performed on fusion digests. Alpha activity was less than detection levels in the drainable liquid samples. Results for the solids ranged from <0.00476 to 0.0069 μCi/g.

B2.1.3.2 Thermogravimetric Analysis. Thermogravimetric analysis measures the mass of a sample as its temperature is increased at a constant rate. Nitrogen is passed over the sample during heating to remove any released gases. A decrease in the weight of a sample during TGA represents a loss of gaseous matter from the sample, through evaporation or through a reaction that forms gas phase products. The moisture content is estimated by assuming that all TGA sample weight loss up to a certain temperature (typically 150 to 200 °C [300 to 390 °F]) is caused by water evaporation. The temperature limit for moisture loss is chosen by the operator at an inflection point on the TGA plot. Other volatile matter fractions can often be differentiated by inflection points as well.

Percent water results ranged from 19.36 percent to 58.66 percent for solids samples and from 46.72 percent to 63.72 percent for drainable liquids.

B2.1.3.3 Differential Scanning Calorimetry. In a DSC analysis, heat absorbed or emitted by a substance is measured while the sample is heated at a constant rate. Nitrogen is passed over the sample material to remove any gases being released. The onset temperature for an endothermic or exothermic event is determined graphically.

The DSC analyses were performed in duplicate on 64 direct subsamples. No exothermic energy was observed for 13 of the samples submitted. Twenty-three samples had a single exothermic event and 27 samples reported two exotherms. One sample showed three small exotherms (Esch 1998).

The calculated dry-weight results for one sample (core 226, segment 15, drainable liquid, S98T000514) exceeded the notification limit of 480 J/g. This segment was unusual because it got stuck in the drill string after the sampling was completed, and it was several days before it was removed. The RGS extraction process required that 300 mL of 0.2*M* ammonium hydroxide be added to the sample in the extractor. This may have caused a change in the composition of the solids. For other segments, visual inhomogeneities were noted during the extrusion. Calculated dry-weight exotherms ranged from 9.5 to 498.7 J/g for liquids and 14.7 to 282.5 J/g for solid samples.

B2.1.3.4 Inductively Coupled Plasma. The ICP analysis was performed in duplicate. Liquid subsamples were prepared for analysis by an acid adjustment of the direct subsample. Solid subsamples were prepared for analysis by performing an acid digest. The only required ICP analytes were lithium (for process control); and aluminum, chromium, and iron (for the historical program). A full suite of ICP analyses was also required for the historical program for selected segments and core composites. All other ICP analytical results were considered "opportunistic."

For process control, lithium analysis was performed to check for intrusion of hydrostatic head fluid that was added to the drill string during core sampling. Lithium was observed in 45 of the 50 solid subsamples. The concentration ranged from 5.60 μg/g to 669 μg/g. In most cases, the concentration was less than 10 times the detection limit. The highest concentration observed in the segment solids was 669 μg/g in core 226, segment 1, lower half solids (S98T000088). Ten of the drainable liquid subsamples contained lithium in the range of 6.12 μg /mL to 35.4 μg/mL. For additional information on the potential impact of lithium contamination, see Appendix C.

Fingerprint analytes, aluminum, chromium, and iron were required on selected segment solids and the core composites. The analysis was performed on acid digested portions of the solids. Both aluminum and iron contamination was noted in some acid digestion preparation blanks. However, the levels of contamination were considered insignificant with respect to the sample results, and no redigestion or reanalysis was requested.

Analysis of the full suite of ICP analytes was required on a water leach of solids from segments 5, 11, and 14 from each core and both core composite samples. The pH of the water-leached samples was adjusted with acid before the ICP analysis. This acid adjustment is the most likely cause for the boron, silicon, and sodium contamination observed in the preparation blanks. These analytes are common contaminants caused by leaching from the glassware. No other analytes were detected in the preparation blanks.

B2.1.3.5 Ion Chromatography (Ions). Ion chromatography analyses were performed in duplicate. Analysis of liquid subsamples was performed on direct aliquots. The solids were prepared for analysis by a water digestion. The only required IC analytes were bromide (for process control); and nitrate, nitrite, phosphate, and sulfate, for segments 5, 11, and 14 and core composites (for the historical program). All other IC analytical results were considered "opportunistic."

The bromide analysis was performed to check for intrusion of hydrostatic head fluid that was added to the drill string during core sampling. Bromide was observed in 30 of 50 solid subsamples. The concentration ranged from 420 μg/g to 3,881 μg/g. Eleven of the 16 drainable liquid subsamples contained bromide in the range of 159 μg/mL to 2,920 μg/mL.

B2.1.3.6 Specific Gravity and Bulk Density. Bulk density was performed on the solid subsamples. Because ammonium hydroxide was added to the RGS segment, which changed the composition of the solids, no bulk density was performed on that segment. Bulk density ranged from 1.38 g/mL to 1.97 g/mL.

The specific gravity was determined for the drainable segment level liquids. The segment sample results ranged from 1.306 to 1.572.

B2.1.3.7 Total Organic Carbon and Total Inorganic Carbon. Total inorganic carbon and TOC analysis by persulfate oxidation/coulometry were performed in duplicate on direct solids and drainable liquid subsamples. Total organic carbon results ranged from <40 to 14,400 μg/g for solids and <40 to 4,850 μg/mL for liquids. Total inorganic carbon results for solids ranged from 616 to 24,700 μg/g and for liquids from 57.4 to 14,500 μg/mL.

Total organic carbon analysis by furnace oxidation/coulometry was required for samples for which the TOC by persulfate did not account for at least 75 percent of the exothermic energy. The analysis was performed in duplicate on direct subsamples for the drainable liquids and on a water digest for the solid samples. Two solids and five liquid samples received this analysis.

B2.1.3.8 Strontium 89/90. Strontium-90 was measured on the solids from segments 5, 11, and 14 from each core, and on the two core composites. The analysis was performed in duplicate on fusion digests. Sample results ranged from 0.134 to 36.7 μCi/g.

B2.1.3.9 Gamma Energy Analysis. Gamma energy analysis was performed on every half segment solid sample. The analysis was performed in duplicate on fusion digests. Cesium-137 was the only required isotope. Cobalt-60 analyses were considered "opportunistic." Cesium-137 sample results ranged from 43.9 to 395 μCi/g. (Liquids ranged from 367 to 430 μCi/mL.) Cobalt-60 analytes were mostly below detection levels.

B2.1.3.10 Total Beta Activity. To satisfy the historical program needs, the total beta was measured only on solids from segments 5, 11, and 14 from each core and the two core composites. The analysis was performed in duplicate on fusion digests. Total beta activity ranged from 104 to 282 μCi/g.

B2.1.3.11 Total Uranium. Total uranium was measured only on the solids from segments 5, 11, and 14 from each core and the two core composites. The analyses were performed in duplicate on fusion digests. Solid results ranged from 2.26 to 484 μCi/g and 0.809 to 0.965 μg/mL for liquids.

B2.1.3.12 Retained Gas Sample Results. Gas in the RGS sample occupied 17.8 ± 1.6 volume percent of the waste under in situ conditions (1.46 atmospheric pressure pressure and 54 °C). X-rays of this sample showed a bubble structure throughout the depth of the waste, with bubbles 2 mm and less in size, some joined or distorted bubble shapes, and a lumpy waste surface. The gas gap at the top of the waste was about 1/4 inch and about

1.2 volume percent. This gas fraction is much less than the gas volume found by extraction, indicating that nearly all of the gas (about 16 volume percent) is in the bubble structure. The amount of gas in the RGS sample appeared typical of waste in the upper layer of tank 241-AX-101. Both segments 2 and 10 contained more bubble structure than was in the RGS sample, including bubbles about 8-mm diameter (segment 10) and a sampler-spanning bubble (segment 2). Segment 14 contained some bubble structure (2 mm diameter or less) in the bottom third of the sampler but nothing discernible above that. The gas-gap volume fractions from these X-rayed samples are 7.4 volume percent (segment 2), 4.3 volume percent (segment 10), and 1.7 volume percent (segment 14).

The composition of the retained gas in the RGS sample was estimated to be 60 ± 7.6 mol% H_2, 16 ± 4.1 mol% N_2, 11 ± 1.5 mol% N_2O, 2.4 ± 0.3 mol% CH_4, and 9.2 ± 3.8 mol% NH_3, the remainder being trace hydrocarbons.

The total ammonia concentration in the sample was 150,000 μmol NH_3/L waste, which corresponds to a dissolved ammonia concentration of about 5,800 μg NH_3/mL liquid (0.34 molar) (Brothers 1998).

A comparison of the ammonia concentration found by RGS to the ammonia concentrations measured in tank 241-AX-101 grab samples (1,460 to 1,970 μg NH_3/mL) suggests RGS ammonia concentration is high.

B2.2 JULY 1997 GRAB SAMPLE

Grab samples 1AX-97-1, -2, -3, and -4 were collected from riser 5B on July 29, 1997. The grab samples were obtained to assess compatibility requirements (Fowler 1995) in accordance with the compatibility sampling and analysis plan (Sasaki 1997). Although not in effect at the time samples were taken, the sample results were also assessed against Mulkey and Miller (1997).

B2.2.1 Sample Handling

All four samples contained settled solids that appeared to be large salt crystals that precipitated upon cooling to ambient temperature. Less than 25 percent of the settled solids were present in the first three samples; therefore, only the supernatant was subsampled and analyzed.

Sample 1AX-97-4 contained approximately 25.3 percent settled solids. This sample was reserved for boil down and dissolution testing. However, before the analysis the sample was inadvertently archived without the solids portion. Consequently the boil down tests were not performed (Esch 1997).

A description of each of the samples is presented in Table B2-6.

Table B2-6. Appearance Information for Tank 241-AX-101 Grab Samples.

Sample Number	Date Sampled	Date Received	Sampling Depth (in.)[1]	% Settled Solids	Sample Description
1AX-97-1	7/29/97	7/29/97	264	9.6	Clear yellow liquid, no organic layer, solids consisted of gray/white salt crystals.
1AX-97-2	7/29/97	7/29/97	234	10.8	Clear yellow liquid, no organic layer, solids consisted of gray/white salt crystals.
1AX-97-3	7/29/97	7/29/97	150	18.1	Clear yellow liquid, no organic layer, solids consisted of white salt crystals.
1AX-97-4	7/29/97	7/29/97	36	25.3	Clear yellow liquid, no organic layer, solids consisted of white salt crystals.

Note:

[1]Sample depth is the distance from the tank bottom to the mouth of the sample bottle.

B2.2.2 Sample Analysis

The samples were analyzed for DSC, hydroxide, percent water, pH, ammonia, anions, and aluminum, iron and sodium cations, TIC and TOC. A GEA analysis was performed for ^{137}Cs, and analysis was also performed for ^{90}Sr and ^{241}Am radionuclides.

Table B2-7 lists the analyses, which were performed according to approved laboratory procedures. Table B2-8 summarizes the sample portions, sample numbers, and analyses performed on each sample.

Table B2-7. Analytical Procedures[1]

Analysis	Method	Procedure Number
Energetics	Differential Scanning Calorimetry	LA-514-114
Percent water	Thermogravimetric Analysis	LA-514-114
TOC/TIC	Persulfate oxidation coulometry	LA-342-100
Metals	Inductively coupled plasma atomic emission spectrometry	LA-505-161
Anions	Ion chromatography	LA-533-105
Radionuclides	Gamma energy analysis	LA-548-121
^{90}Sr	Beta proportional counting	LA-220-101
Hydroxide	Titration	LA-211-102
pH	Direct	LA-212-106
Bulk density	Gravimetry	LO-160-103
Specific gravity	Gravimetry	LA-510-112
Ammonia	Ion selective electrode	LA-631-001
TOC	Furnace oxidation	LA-344-105
Settled % solids		LA-519-151
Total uranium	Phosphorescence	LA-925-009
^{241}Am	Atomic energy analysis	LA-953-104
$^{239/240}Pu$	Atomic energy analysis	LA-953-104

Note:

[1]Sasaki (1997)

Table B2-8. Tank 241-AX-101 Sample Analysis Summary.[1]

Riser/Depth	Sample ID	Sample Portion	Sample Number	Analyses
5B/264 in.	1AX-97-1	Whole	S97T001896	DSC, TGA, specific gravity, OH, IC, ICP, TOC, TIC, pH
			S97T001899	^{90}Sr, ^{241}Am, U_{TOTAL}, $^{239/240}Pu$, GEA, NH_3
			S97T001902	NH_3 acid dilution
			S97T001824	vol% settled solids
			S97T001968	NH_3 acid dilution
5B/234 in.	1-AX-97-2	Whole	S95T001897	DSC, TGA, specific gravity, OH, IC, ICP, TOC, TIC, pH
			S95T001900	^{90}Sr, ^{241}Am, U_{TOTAL}, $^{239/240}Pu$, GEA, NH_3
			S95T001903 S95T001969	NH_3 acid dilution
			S97T001825	vol% settled solids
5B/150 in.	1-AX-97-3	Whole	S95T001898	DSC, TGA, specific gravity, OH, IC, ICP, TOC, TIC, pH
			S95T001901	^{90}Sr, ^{241}Am, U_{TOTAL}, $^{239/240}Pu$, GEA, NH_3
			S95T001904 S95T001970	NH_3 acid dilution
			S97T001826	vol% settled solids
5B/36 in.	1-AX-97-4	Whole	S97T001827	vol% settled solids

Note:
[1]Esch (1997)

B2.2.3 Analytical Results

This section summarizes the sampling and analytical results associated with the July 1997 grab sampling and analysis of tank 241-AX-101. Table B2-9 shows the location of the analytical results associated with this tank. These results are documented in Esch (1997).

Table B2-9. Analytical Tables.

Analysis	Table Number
Inductively Coupled Plasma/Emission Spectroscometry	B2-76 to 112
Total Uranium	B2-113
Ion Chromatography	B2-114 to 121
Energetics by Differential Scanning Calorimetry	B2-122
Percent Water by Thermogravimetric Analysis	B2-123
pH	B2-124
Specific Gravity	B2-125
Americium-241	B2-126
Gamma Energy Analysis	B2-127and 128
$^{239/240}Pu$	B-129
$^{89/90}Sr$	B2-130
Total Organic Carbon by Furnace Oxidation	B2-131
Ammonia	B2-132 and 133
Hydroxide	B2-134
Total Inorganic Carbon	B2-135
Total Organic Carbon by Persulfate	B2-136

The QC parameters assessed in conjunction with tank 241-AX-101 samples were standard recoveries, spike recoveries, duplicate analyses (RPDs), and blanks. The QC criteria are specified in Sasaki (1997). Sample and duplicate pairs, in which any QC parameter was outside these limits, are footnoted in the sample mean column of the following data summary tables with an a, b, c, d, e, or f as follows.

- "a" indicates the standard recovery was below the QC limit.
- "b" indicates the standard recovery was above the QC limit.
- "c" indicates the spike recovery was below the QC limit.
- "d" indicates the spike recovery was above the QC limit.
- "e" indicates the RPD was above the QC limit.
- "f" indicates blank contamination.

In the analytical tables in this section, the "mean" is the average of the result and duplicate value. All values, including those below the detection level (<) were averaged. If both sample and duplicate values were nondetected or, if one value was detected and the other was not, the mean is expressed as a nondetected value. If both values were detected, the mean is expressed as a detected value.

B2.3 VAPOR PHASE MEASUREMENT

Before the 1998 core sampling of tank 241-AX-101, a vapor phase measurement was taken. Additional measurements were made on June 15, 1996. These measurements supported the organic solvents DQO (Meacham et al. 1997). The vapor phase screening was taken for flammability issues. The 1998 vapor phase measurements were taken 6.1 m (20 ft) below riser 9D in the headspace of the tank and results were obtained in the field (that is, no gas sample was sent to the laboratory for analysis). The results of the 1998 vapor phase measurements are provided in Table B2-10. June 15, 1996, vapor samples were taken through riser 9F at 7.3 m below the top of the riser. Tables B2-10 and B2-11 show the results.

Table B2-10. Results of Headspace Measurements of Tank 241-AX-101.

Measurement	Result	
	January/February 1998	**June 15, 1995[1]**
Total organic carbon	0-1.1 ppm	n/r
Lower flammability limit	0-3% of lower flammability limit	0% of lower flammability limit
Oxygen	20.9%	20.9%
Ammonia	0-20 ppm	30 ppm

Note:

[1]Caprio (1995)

Table B2-11. Results of June 15, 1995, Headspace Vapor Samples.

Category	Sample Medium	Analyte	Concentration	Units
Inorganic Analytes	Sorbent Traps	NH_3	42±2	ppmv
		NO_2	≤0.03	ppmv
		NO	0.10 ±0.02	ppmv
		H_2O	13.4±04	mg/L
Permanent Gases	SUMMA[1] Canister	H_2	103	ppmv
		CH_4	<12	ppmv
		CO_2	316	ppmv
		CO	<12	ppmv
		N_2O	<12.6	ppmv
Volatile Organics	SUMMA™ Canister	Methyl alcohol	0.135	ppmv
		1-Butanol	0.114	ppmv
		Acetone	0.083	ppmv
Semi-Volatile Organics	Sorbent Traps	1-Butanol	0.118	ppmv
		Methyl alcohol	0.072	ppmv
		Propene	0.051	ppmv

Note:

Pool et al. (1996)

B2.4 DESCRIPTION OF HISTORICAL SAMPLING EVENTS

Sampling data for tank 241-AX-101 are available for a number of grab samples analyzed between August 1975 and November 1980. Pre-1989 analytical data have not been validated and should be used with caution.

B2.4.1 October/November 1980 Grab Samples

One grab sample was obtained by the Separations Process Development Unit in October 1980, and two grab samples were obtained in November 1980. The November 1980 samples were taken from two feet below the waste surface, and the other was taken four feet below the

[1]SUMMA is a trademark of Moletrics, Inc., Cleveland, Ohio.

surface. Both samples contained greater than 60 volume percent solids at room temperature. The solids visually appeared to be sodium nitrate crystals. Aliquots of both samples were filtered. The filtered solids comprised 20-25 weight percent of the slurry. Table B2-12 shows the analytical results for the samples. Because of the thickness of the waste samples, the specific gravity was difficult to measure. Consequently, a calculated specific gravity value of 1.43 was used to estimate radioactivity in the waste slurry (Jansky 1980c).

Viscosity versus temperature data showed that solids precipitated as the waste temperature decreased. The data indicate that at room temperature, a significant volume of solids exist. The viscosity of the waste begins to approach 100 centipoise at 50 °C.

The October 1980 sample #5169) was a surface sample containing 50 percent settled solids. Two aliquots of the waste were centrifuged. After centrifuging, a thin green layer was observed on top of the solids. Supernatant was decanted, and the solids and supernatant were analyzed. A separate aliquot was heated to 60°C. After 15 minutes, the solid had completely dissolved forming a creamy slurry. The slurry was cooled, and crystals started to reform at 35 °C. Table B2-13 shows the analytical results for the sample.

Table B2-12. November 1980 Composition of Tank 241-101AX Waste.[1,2]

Component	Two Feet Below Surface			Four Feet Below Surface		
	Filtrate (M)	wt%	Solids (wt%)	Filtrate (M)	wt%	Solids (wt%)
$NaAlO_2$	2.23	13.41	n/r	2.06	12.13	n/r
NaOH	3.69	10.84	n/r	3.67	10.55	n/r
$NaNO_2$	5.14	26.10	13	2.59	12.85	23
$NaNO_3$	1.66	10.36	82	1.69	10.35	66
$NaCO_3$	0.07	0.53	n/r	0.108	0.82	7
$NaPO_4$	0.07	0.82	n/r	0.07	0.82	n/r
TOC	15 g/L	3.32	n/r	15 g/L	3.23	n/r
^{137}Cs	6.60 E+05 μCi/L			6.56E+05 μCi/L		
^{90}Sr	4,310 μCi/L			4,450 μCi/L		
H_2O	44.6 wt%			43.4 wt%		
Specific gravity	1.360			1.391		

Note:

[1]Jansky (1980c)

[2]These data have not been validated and should be used with caution.

Table B2-13. October 1980 Composition of 101AX Waste (Sample 5169).[1, 2]

Component	Surface Sample		
	Filtrate (*M*)	wt%	Solids (wt%)
Al_2	1.87	11.0	10
OH	3.18	9.1	0
NO_2	2.91	14.4	0
NO_3	1.85	11.3	34
CO_3	0.115	0.9	43
PO_4	0.073	0.9	2
TOC	7.46 g/L	1.6	8
H_2O	42.46 wt %		
Specific gravity	1.395		

Note:

[1]Jansky (1980b)
[2]These data have not been validated and should be used with caution.

B2.4.2 July/August 1980 Hot Boil Down Samples

Two samples were analyzed: sample T-3102 was obtained 2 feet below the surface and contained about 40 percent phosphate solids; sample T-3103 was obtained 2 feet above the solids level in the tank and contained about 20 percent carbonate solids. Hot boildowns were performed, T-3102 had 95 percent solids after it was reduced in volume by 40 percent and allowed to stand approximately 1 hour. T-3103 had 90 percent solids at weight volume reduction of 30 percent and after sitting for approximately 1 hour. Similar results were observed in the July 1980 boil down test using sample 1527, obtained four feet below the surface (Jansky and Herting 1980). Table B2-14 shows the analytical results for the three samples.

Table B2-14. July/August 1980 Hot Boil Down Tank 241-101-AX Samples.[1, 2] (2 sheets)

Component	T-3102 (*M*)	T-3103 (*M*)	#1527 (*M*)
Al	1.35	1.58	0.867
OH	2.30	2.84	1.51
NO_2	1.93	2.31	1.43
NO_3	3.04	3.34	2.316

Table B2-14. July/August 1980 Hot Boil Down Tank 241-101-AX Samples.[1,2] (2 sheets)

Component	T-3102 (*M*)	T-3103 (*M*)	#1527 (*M*)
CO_3	0.415	0.220	0.340
PO_4	0.112	0.117	0.0534
TOC (g/L)	13.0	11.4	n/r
^{137}Cs (μCi/L)	4.48E+05	4.99E+05	n/r
$^{89/90}$Sr (μCi/L)	17,600	8,820	n/r
Pu (g/L)	4.37E-05	3.26E-05	n/r
H_2O	51.79	47.82	62.68
Specific gravity	1.445	1.512	1.325

Note:
[1]Jansky (1980a) and Jansky and Herting (1980)
[2]These data have not been validated and should be used with caution.

B2.4.3 July/August 1976 Sludge Samples

Sludge samples were received in July 23 and August 16, 1976, to determine heat generation rates for tank 241-AX-101. Strontium, cesium, and plutonium measurements were made by fusing a known volume of solids from each sample with KOH, dissolving each melt with concentrated HCl and diluting each sample with water. Table B2-15 shows the analytical results.

Table B2-15. July/August 1976 Tank 241-AX-101 Radionuclide Analyses.[1,2]

Sample Number	5817	5818	5819	6160
$^{89/90}$Sr (Ci/L)	28.0	36.0	36.0	35.1
^{137}Cs (Ci/L)	3.3	1.4	1.9	0.9
Pu (g/L)	0.0545	0.0675	0.0473	0.0291

Note:
[1]Horton (1976)
[2]These data have not been validated and should be used with caution.

B2.4.4 July 1975 Sludge Sample

The first recorded sludge sample for tank 241-AX-101 was received by the Chemical Technology Laboratory on July 14, 1975 (Horton 1975). The sample was reddish brown in color. The sample was analyzed by fusing 0.9 mL of damp sludge with KOH, dissolving the melt with concentrated HCl and diluting it with water. Particle size distribution showed that 94 weight percent of the sludge was between 5 and 20 μm. Six weight percent was between 20 and 90 μm. Table B2-16 shows the analytical results.

Table B2-16. July 1975 Sludge and Supernatant Analyses for Tank 241-AX-101.[1,2]
(2 sheets)

Sludge Component		Analytical Result
Bulk density	(g/mL)	1.30
Particle density	(g/mL)	1.80
% H_2O	(% by wt)	47.6
$NaAlO_2$	(*M*/L)	3.8
Fe	(*M*/L)	3.3
$NaNO_2$	(*M*/L)	<0.4
$NaNO_3$	(*M*/L)	10.6
Mn	(*M*/L)	0.03
Mg	(*M*/L)	0.07
Ca	(*M*/L)	0.4
Ba	(*M*/L)	0.01
Si	(*M*/L)	0.74
Pu	(g/L)	0.0624
$^{89/90}Sr$	(Ci/L)	28.2
^{137}Cs	(μCi/L)	451
^{134}Cs	(μCi/L)	65.4
^{125}Sb	(μCi/L)	10.8
^{154}Eu	(μCi/L)	4.94

Table B2-16. July 1975 Sludge and Supernatant Analyses for Tank 241-AX-101.[1,2]
(2 sheets)

Supernatant Component		**Analytical Result**
Density	unitless	1.114
$\%H_2O$	% by wt.	86.8
NaOH	(*M*/L)	0.430 (1.5%)
$NaAlO_2$	(*M*/L)	8.95E-04
$NaNO_2$	(*M*/L)	0.617 (3.8%)
$NaNO_3$	(*M*/L)	0.172 (1.3%)
Na_2CO_3	(*M*/L)	0.456 (4.3%)
Na_2PO_4	(*M*/L)	0.00664 (1.0%)
Sludge Particle Size Distribution		
Particle Size (μm)	**Average Dia (μm)**	**Weight Percent**
5-10	8.25	12.8
10-15	12.98	30.9
15-20	17.85	30.6
20-30	25.90	19.3
30-40	35.70	1.8
40-50	45.50	1.4
50-60	55.40	1.2
60-70	65.40	0.9
70-80	75.30	0.5
80-90	85.50	0.7

Note:

[1]Horton (1975)

[2]These data have not been validated and should be used with caution.

1998 PUSH CORE DATA TABLES

Table B2-17. Tank 241-AX-101 Analytical Results: Aluminum (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			µg/g	µg/g	µg/g
S98T000088	226:1	Lower half	9,050	8,030	8,540[QC:c]
S98T000095	226:2	Upper half	22,600	23,300	23,000
S98T000099		Lower half	25,800	26,000	25,900
S98T000127	226:3	Upper half	23,300	22,600	23,000
S98T000128		Lower half	22,300	22,700	22,500
S98T000129	226:4	Upper half	24,300	22,900	23,600
S98T000130		Lower half	24,800	24,600	24,700
S98T000131	226:5	Upper half	23,300	23,900	23,600
S98T000132		Lower half	22,300	22,100	22,200
S98T000159	226:6	Upper half	23,900	23,500	23,700
S98T000160		Lower half	24,500	24,500	24,500
S98T000161	226:7	Upper half	23,300	25,000	24,200
S98T000162		Lower half	23,600	24,500	24,100
S98T001005	226:8	Whole	15,300	10,000	12,700[QC:e]
S98T000229	226:9	Upper half	24,700	24,600	24,700
S98T000244		Lower half	24,000	24,800	24,400
S98T000273	226:10	Upper half	25,200	25,700	25,500
S98T000277		Lower half	26,900	25,400	26,200[QC:c]
S98T000274	226:11R	Upper half	26,200	26,900	26,600
S98T000278		Lower half	27,200	29,900	28,600
S98T000275	226:12	Upper half	25,000	25,000	25,000
S98T000279		Lower half	27,000	34,200	30,600[QC:e]
S98T000280	226:13	Whole	26,700	29,100	27,900
S98T000276	226:14	Upper half	18,200	20,600	19,400
S98T000281		Lower half	15,300	13,900	14,600[QC:d]
S98T000510	226:15	Lower half	16,600	28,400	22,500[QC:e]
S98T000544	228:2	Upper half	22,300	23,600	23,000
S98T000545		Lower half	21,800	21,700	21,800[QC:d]

Table B2-17. Tank 241-AX-101 Analytical Results: Aluminum (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**μg/g**	**μg/g**	**μg/g**
S98T000542	228:3	Upper half	22,400	25,000	23,700
S98T000543		Lower half	21,400	23,500	22,500
S98T000540	228:4	Upper half	26,100	25,400	25,800
S98T000541		Lower half	22,400	20,400	21,400
S98T000576	228:5	Upper half	22,800	21,700	22,300
S98T000593		Lower half	18,400	22,700	20,600[QC:d,e,h]
S98T000607	228:6	Upper half	22,100	23,200	22,700
S98T000630		Lower half	21,500	21,500	21,500
S98T000631	228:7	Lower half	22,500	24,500	23,500
S98T000632	228:8	Upper half	20,600	23,600	22,100
S98T000633		Lower half	24,700	22,700	23,700
S98T000594	228:9	Upper half	24,400	25,800	25,100
S98T000595		Lower half	26,000	26,300	26,200
S98T000634	228:10	Lower half	27,500	26,400	27,000[QC:d]
S98T000774	228:11	Lower half	22,500	22,500	22,500
S98T000795	228:12	Lower half	22,300	25,700	24,000
S98T000796	228:13	Lower half	20,600	23,700	22,200
S98T000797	228:14	Lower half	19,200	19,900	19,600[QC:d]
S98T000798	228:15	Lower half	22,000	20,000	21,000
S98T000675	Core 226	Solid composite	14,600	14,500	14,600
S98T000998	Core 228	Solid composite	24,900	25,600	25,300
Liquids			**μg/mL**	**μg/mL**	**μg/mL**
S98T000090	226:1	Drainable liquid	3,460	3,460	3,460
S98T001009	226:8	Drainable liquid	21,100	22,400	21,800
S98T000295	226:11R	Drainable liquid	66,300	62,900	64,600[QC:c]
S98T000303	226:12	Drainable liquid	63,000	63,200	63,100
S98T000304	226:13	Drainable liquid	51,300	51,100	51,200
S98T000305	226:14	Drainable liquid	55,800	52,500	54,200[QC:c]
S98T000514	226:15	Drainable liquid	59,200	60,700	60,000
S98T000652	228:7	Drainable liquid	53,300	54,700	54,000

Table B2-17. Tank 241-AX-101 Analytical Results: Aluminum (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids (Cont'd)			**µg/mL**	**µg/mL**	**µg/mL**
S98T000658	228:10	Drainable liquid	45,400	47,600	46,500
S98T000781	228:11	Drainable liquid	50,300	52,600	51,500
S98T000812	228:12	Drainable liquid	56,300	53,000	54,700
S98T000813	228:13	Drainable liquid	53,000	56,900	55,000
S98T000814	228:14	Drainable liquid	59,400	65,200	62,300[QC:d,h]
S98T000815	228:15	Drainable liquid	68,900	84,700	76,800[QC:e]
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	24,000	24,000	24,000
S98T000732		Lower half	23,300	24,300	23,800[QC:c]
S98T000733	226:11R	Upper half	27,300	28,000	27,700
S98T000734		Lower half	29,600	28,800	29,200
S98T000735	226:14	Lower half	14,000	13,200	13,600
S98T000736	228:5	Upper half	23,100	23,000	23,100
S98T000737		Lower half	23,600	22,700	23,200[QC:c]
S98T000777	228:11	Lower half	21,200	20,900	21,100
S98T000803	228:14	Lower half	19,000	21,000	20,000
S98T000729	Core 226	Solid composite	14,300	13,400	13,900
S98T001000	Core 228	Solid composite	23,400	24,400	23,900

Table B2-18. Tank 241-AX-101 Analytical Results: Antimony (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**µg/g**	**µg/g**	**µg/g**
S98T000088	226:1	Lower half	<35.8	<36	<35.9
S98T000095	226:2	Upper half	<23.9	<23.8	<23.9
S98T000099		Lower half	<36	<35.8	<35.9
S98T000127	226:3	Upper half	<23.3	<23.7	<23.5
S98T000128		Lower half	<35.9	<35.9	<35.9

Table B2-18. Tank 241-AX-101 Analytical Results: Antimony (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000129	226:4	Upper half	<24.5	<24.7	<24.6
S98T000130		Lower half	<35.6	<35.7	<35.7
S98T000131	226:5	Upper half	<34.8	<35.2	<35
S98T000132		Lower half	<36	<35.9	<36
S98T000159	226:6	Upper half	<35.4	<35.2	<35.3
S98T000160		Lower half	<35.7	<35.8	<35.8
S98T000161	226:7	Upper half	<35.2	<35.4	<35.3
S98T000162		Lower half	<34.9	<35.3	<35.1
S98T001005	226:8	Whole	<35.7	<25.1	<30.4
S98T000229	226:9	Upper half	<34.4	<33.9	<34.1
S98T000244		Lower half	<35.3	<35	<35.1
S98T000273	226:10	Upper half	<35.3	<36.4	<35.8
S98T000277		Lower half	<36.4	<36.5	<36.5
S98T000274	226:11R	Upper half	<33.1	<32.8	<33
S98T000278		Lower half	<33.6	<32.9	<33.3
S98T000275	226:12	Upper half	<22	<24.4	<23.2
S98T000279		Lower half	<34.2	<34.1	<34.2
S98T000280	226:13	Whole	<33.7	<34.6	<34.2
S98T000276	226:14	Upper half	<23.5	<23.6	<23.6
S98T000281		Lower half	<36.4	<36.6	<36.5
S98T000510	226:15	Lower half	<35.2	<26.3	<30.8
S98T000544	228:2	Upper half	<35.8	<34.9	<35.3
S98T000545		Lower half	<34.3	<32.6	<33.5
S98T000542	228:3	Upper half	<34	<33.1	<33.5
S98T000543		Lower half	<33.1	<32.4	<32.8
S98T000540	228:4	Upper half	<33.8	<34.2	<34
S98T000541		Lower half	<34.6	<34.2	<34.4
S98T000576	228:5	Upper half	<35.3	<34.5	<34.9
S98T000593		Lower half	<34.2	<33.6	<33.9

Table B2-18. Tank 241-AX-101 Analytical Results: Antimony (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000607	228:6	Upper half	<30.9	<32.2	<31.6
S98T000630		Lower half	<34.3	<33.9	<34.1
S98T000631	228:7	Lower half	<33.9	<33.1	<33.5
S98T000632	228:8	Upper half	<33	<33.8	<33.4
S98T000633		Lower half	<35	<34.1	<34.5
S98T000594	228:9	Upper half	<35.1	<34.5	<34.8
S98T000595		Lower half	<35.3	<35.6	<35.5
S98T000634	228:10	Lower half	<34.7	<35.4	<35
S98T000774	228:11	Lower half	<35.6	<34.2	<34.9
S98T000795	228:12	Lower half	<35.5	<34.6	<35
S98T000796	228:13	Lower half	<35.9	<35.6	<35.8
S98T000797	228:14	Lower half	<33.7	<34.5	<34.1
S98T000798	228:15	Lower half	<33.6	<33	<33.3
S98T000675	Core 226	Solid composite	<34.2	<33.5	<33.9
S98T000998	Core 228	Solid composite	<32.9	<32.5	<32.7
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<24.1	<24.1	<24.1
S98T001009	226:8	Drainable liquid	<36.1	<36.1	<36.1
S98T000295	226:11R	Drainable liquid	<36.1	<36.1	<36.1
S98T000303	226:12	Drainable liquid	<36.1	<36.1	<36.1
S98T000304	226:13	Drainable liquid	<36.1	<36.1	<36.1
S98T000305	226:14	Drainable liquid	<36.1	<36.1	<36.1
S98T000514	226:15	Drainable liquid	<36.1	<36.1	<36.1
S98T000652	228:7	Drainable liquid	<36.1	<36.1	<36.1
S98T000658	228:10	Drainable liquid	<24.1	<24.1	<24.1
S98T000781	228:11	Drainable liquid	<24.1	<24.1	<24.1
S98T000812	228:12	Drainable liquid	<24.1	<24.1	<24.1
S98T000813	228:13	Drainable liquid	<36.1	<36.1	<36.1
S98T000814	228:14	Drainable liquid	<36.1	<36.1	<36.1
S98T000815	228:15	Drainable liquid	<36.1	<36.1	<36.1

Table B2-18. Tank 241-AX-101 Analytical Results: Antimony (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	<25.2	<25	<25.1
S98T000732		Lower half	<36.9	<36.5	<36.7
S98T000733	226:11R	Upper half	<22.2	<22.2	<22.2
S98T000734		Lower half	<24.5	<23.9	<24.2
S98T000735	226:14	Lower half	<36.1	<35.3	<35.7
S98T000736	228:5	Upper half	<33.2	<31.1	<32.2
S98T000737		Lower half	<32.5	<36.4	<34.5
S98T000777	228:11	Lower half	<33.2	<34.8	<34
S98T000803	228:14	Lower half	<37.7	<37.1	<37.4
S98T000729	Core 226	Solid composite	<34.5	<34.2	<34.4
S98T001000	Core 228	Solid composite	<36.2	<36.2	<36.2

Table B2-19. Tank 241-AX-101 Analytical Results: Arsenic (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**µg/g**	**µg/g**	**µg/g**
S98T000088	226:1	Lower half	<59.7	<60	<59.9
S98T000095	226:2	Upper half	<39.8	<39.7	<39.8
S98T000099		Lower half	<60.1	<59.7	<59.9
S98T000127	226:3	Upper half	<38.8	<39.5	<39.1
S98T000128		Lower half	<59.9	<59.9	<59.9
S98T000129	226:4	Upper half	<40.8	<41.2	<41
S98T000130		Lower half	<59.4	<59.5	<59.5
S98T000131	226:5	Upper half	<58	<58.7	<58.4
S98T000132		Lower half	<59.9	<59.8	<59.8
S98T000159	226:6	Upper half	<59	<58.7	<58.9
S98T000160		Lower half	<59.5	<59.6	<59.5
S98T000161	226:7	Upper half	<58.6	<59	<58.8
S98T000162		Lower half	<58.1	<58.9	<58.5

Table B2-19. Tank 241-AX-101 Analytical Results: Arsenic (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			µg/g	µg/g	µg/g
S98T001005	226:8	Whole	<59.5	<41.9	<50.7
S98T000229	226:9	Upper half	<57.4	<56.5	<57
S98T000244		Lower half	<58.9	<58.4	<58.6
S98T000273	226:10	Upper half	<58.8	<60.7	<59.8
S98T000277		Lower half	<60.7	<60.8	<60.8
S98T000274	226:11R	Upper half	<55.1	<54.6	<54.9
S98T000278		Lower half	<56.1	<54.8	<55.5
S98T000275	226:12	Upper half	<36.7	<40.6	<38.7
S98T000279		Lower half	<56.9	<56.9	<56.9
S98T000280	226:13	Whole	<56.1	<57.7	<56.9
S98T000276	226:14	Upper half	<39.1	<39.4	<39.3
S98T000281		Lower half	<60.7	<61	<60.9
S98T000510	226:15	Lower half	<58.6	<43.8	<51.2
S98T000544	228:2	Upper half	<59.7	<58.2	<59
S98T000545		Lower half	<57.1	<54.3	<55.7
S98T000542	228:3	Upper half	<56.7	<55.2	<56
S98T000543		Lower half	<55.1	<54	<54.5
S98T000540	228:4	Upper half	<56.3	<57	<56.6
S98T000541		Lower half	<57.7	<57	<57.4
S98T000576	228:5	Upper half	<58.9	<57.5	<58.2
S98T000593		Lower half	<57	<56	<56.5
S98T000607	228:6	Upper half	<51.6	<53.7	<52.7
S98T000630		Lower half	<57.1	<56.5	<56.8
S98T000631	228:7	Lower half	<56.5	<55.1	<55.8
S98T000632	228:8	Upper half	<55	<56.3	<55.6
S98T000633		Lower half	<58.4	<56.8	<57.6
S98T000594	228:9	Upper half	<58.5	<57.5	<58
S98T000595		Lower half	<58.8	<59.3	<59
S98T000634	228:10	Lower half	<57.8	<59	<58.4
S98T000774	228:11	Lower half	<59.3	<56.9	<58.1

Table B2-19. Tank 241-AX-101 Analytical Results: Arsenic (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000795	228:12	Lower half	<59.2	<57.7	<58.5
S98T000796	228:13	Lower half	<59.8	<59.3	<59.5
S98T000797	228:14	Lower half	<56.2	<57.4	<56.8
S98T000798	228:15	Lower half	<56.1	<54.9	<55.5
S98T000675	Core 226	Solid composite	<56.9	<55.8	<56.3
S98T000998	Core 228	Solid composite	<54.8	<54.2	<54.5
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<40.1	<40.1	<40.1
S98T001009	226:8	Drainable liquid	<60.1	<60.1	<60.1
S98T000295	226:11R	Drainable liquid	<60.1	<60.1	<60.1
S98T000303	226:12	Drainable liquid	<60.1	<60.1	<60.1
S98T000304	226:13	Drainable liquid	<60.1	<60.1	<60.1
S98T000305	226:14	Drainable liquid	<60.1	<60.1	<60.1
S98T000514	226:15	Drainable liquid	<60.1	<60.1	<60.1
S98T000645	228:7	Drainable liquid	<4.1	<4.1	<4.1
S98T000652		Drainable liquid	<60.1	<60.1	<60.1
S98T000658	228:10	Drainable liquid	<40.1	<40.1	<40.1[QC:c]
S98T000781	228:11	Drainable liquid	<40.1	<40.1	<40.1
S98T000812	228:12	Drainable liquid	<40.1	<40.1	<40.1
S98T000813	228:13	Drainable liquid	<60.1	<60.1	<60.1
S98T000814	228:14	Drainable liquid	<60.1	<60.1	<60.1[QC:c]
S98T000815	228:15	Drainable liquid	<60.1	<60.1	<60.1
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	<41.9	<41.7	<41.8
S98T000732		Lower half	<61.6	<60.8	<61.2
S98T000733	226:11R	Upper half	<37	<37.1	<37
S98T000734		Lower half	<40.8	<39.8	<40.3
S98T000735	226:14	Lower half	<60.1	<58.8	<59.5
S98T000736	228:5	Upper half	<55.4	<51.9	<53.6
S98T000737		Lower half	<54.1	<60.7	<57.4

Table B2-19. Tank 241-AX-101 Analytical Results: Arsenic (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest (Cont'd)			µg/g	µg/g	µg/g
S98T000777	228:11	Lower half	<55.4	<58.1	<56.8
S98T000803	228:14	Lower half	<62.9	<61.9	<62.4
S98T000729	Core 226	Solid composite	<57.6	<57	<57.3
S98T001000	Core 228	Solid composite	<60.3	<60.4	<60.3

Table B2-20. Tank 241-AX-101 Analytical Results: Barium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			µg/g	µg/g	µg/g
S98T000088	226:1	Lower half	<29.8	<30	<29.9
S98T000095	226:2	Upper half	<19.9	<19.8	<19.9
S98T000099		Lower half	<30	<29.8	<29.9
S98T000127	226:3	Upper half	<19.4	<19.8	<19.6
S98T000128		Lower half	<29.9	<29.9	<29.9
S98T000129	226:4	Upper half	<20.4	<20.6	<20.5
S98T000130		Lower half	<29.7	<29.8	<29.8
S98T000131	226:5	Upper half	<29	<29.4	<29.2
S98T000132		Lower half	<30	<29.9	<29.9
S98T000159	226:6	Upper half	<29.5	<29.3	<29.4
S98T000160		Lower half	<29.8	<29.8	<29.8
S98T000161	226:7	Upper half	<29.3	<29.5	<29.4
S98T000162		Lower half	<29.1	<29.4	<29.3
S98T001005	226:8	Whole	<29.8	<20.9	<25.4
S98T000229	226:9	Upper half	<28.7	<28.2	<28.4
S98T000244		Lower half	<29.4	<29.2	<29.3
S98T000273	226:10	Upper half	<29.4	<30.3	<29.9
S98T000277		Lower half	<30.4	<30.4	<30.4
S98T000274	226:11R	Upper half	<27.5	<27.3	<27.4
S98T000278		Lower half	<28	<27.4	<27.7

Table B2-20. Tank 241-AX-101 Analytical Results: Barium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000275	226:12	Upper half	<18.3	<20.3	<19.3
S98T000279		Lower half	<28.5	<28.4	<28.4
S98T000280	226:13	Whole	<28.1	<28.8	<28.5
S98T000276	226:14	Upper half	<19.6	<19.7	<19.6
S98T000281		Lower half	<30.4	<30.5	<30.4
S98T000510	226:15	Lower half	<29.3	<21.9	<25.6
S98T000544	228:2	Upper half	<29.8	<29.1	<29.5
S98T000545		Lower half	<28.6	<27.2	<27.9
S98T000542	228:3	Upper half	<28.3	<27.6	<28
S98T000543		Lower half	<27.6	<27	<27.3
S98T000540	228:4	Upper half	<28.2	<28.5	<28.4
S98T000541		Lower half	<28.8	<28.5	<28.6
S98T000576	228:5	Upper half	<29.4	<28.8	<29.1
S98T000593		Lower half	<28.5	<28	<28.3
S98T000607	228:6	Upper half	<25.8	<26.9	<26.4
S98T000630		Lower half	<28.5	<28.3	<28.4
S98T000631	228:7	Lower half	<28.3	<27.6	<28
S98T000632	228:8	Upper half	<27.5	<28.2	<27.9
S98T000633		Lower half	<29.2	<28.4	<28.8
S98T000594	228:9	Upper half	<29.3	<28.7	<29
S98T000595		Lower half	<29.4	<29.6	<29.5
S98T000634	228:10	Lower half	<28.9	<29.5	<29.2
S98T000774	228:11	Lower half	<29.6	<28.5	<29.1
S98T000795	228:12	Lower half	<29.6	<28.9	<29.3
S98T000796	228:13	Lower half	<29.9	<29.6	<29.8
S98T000797	228:14	Lower half	<28.1	<28.7	<28.4
S98T000798	228:15	Lower half	<28	<27.5	<27.8
S98T000675	Core 226	Solid composite	<28.5	<27.9	<28.2
S98T000998	Core 228	Solid composite	<27.4	<27.1	<27.3

Table B2-20. Tank 241-AX-101 Analytical Results: Barium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<20.1	<20.1	<20.1
S98T001009	226:8	Drainable liquid	<30.1	<30.1	<30.1
S98T000295	226:11R	Drainable liquid	<30.1	<30.1	<30.1
S98T000303	226:12	Drainable liquid	<30.1	<30.1	<30.1
S98T000304	226:13	Drainable liquid	<30.1	<30.1	<30.1
S98T000305	226:14	Drainable liquid	<30.1	<30.1	<30.1
S98T000514	226:15	Drainable liquid	<30.1	<30.1	<30.1
S98T000645	228:7	Drainable liquid	<2.05	<2.05	<2.05
S98T000652		Drainable liquid	<30.1	<30.1	<30.1
S98T000658	228:10	Drainable liquid	<20.1	<20.1	<20.1
S98T000781	228:11	Drainable liquid	<20.1	<20.1	<20.1
S98T000812	228:12	Drainable liquid	<20.1	<20.1	<20.1
S98T000813	228:13	Drainable liquid	<30.1	<30.1	<30.1
S98T000814	228:14	Drainable liquid	<30.1	<30.1	<30.1
S98T000815	228:15	Drainable liquid	<30.1	<30.1	<30.1
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226: 5	Upper half	<21	<20.9	<20.9
S98T000732		Lower half	<30.8	<30.4	<30.6
S98T000733	226:11R	Upper half	<18.5	<18.5	<18.5
S98T000734		Lower half	<20.4	<19.9	<20.1
S98T000735	226:14	Lower half	<30.1	<29.4	<29.8
S98T000736	228: 5	Upper half	<27.7	<26	<26.9
S98T000737		Lower half	<27.1	<30.4	<28.8
S98T000777	228:11	Lower half	<27.7	<29	<28.4
S98T000803	228:14	Lower half	<31.5	<30.9	<31.2
S98T000729	Core 226	Solid composite	<28.8	<28.5	<28.6
S98T001000	Core 228	Solid composite	<30.2	<30.2	<30.2

Table B2-21. Tank 241-AX-101 Analytical Results: Beryllium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**μg/g**	**μg/g**	**μg/g**
S98T000088	226:1	Lower half	<2.98	<3	<2.99
S98T000095	226:2	Upper half	<1.99	<1.98	<1.98
S98T000099		Lower half	<3	<2.98	<2.99
S98T000127	226:3	Upper half	<1.94	<1.98	<1.96
S98T000128		Lower half	<2.99	<2.99	<2.99
S98T000129	226:4	Upper half	<2.04	<2.06	<2.05
S98T000130		Lower half	<2.97	<2.98	<2.98
S98T000131	226:5	Upper half	<2.9	<2.94	<2.92
S98T000132		Lower half	<3	<2.99	<3
S98T000159	226:6	Upper half	<2.95	<2.93	<2.94
S98T000160		Lower half	<2.98	<2.98	<2.98
S98T000161	226:7	Upper half	<2.93	<2.95	<2.94
S98T000162		Lower half	<2.91	<2.94	<2.92
S98T001005	226:8	Whole	<2.98	<2.09	<2.54
S98T000229	226:9	Upper half	<2.87	<2.82	<2.84
S98T000244		Lower half	<2.94	<2.92	<2.93
S98T000273	226:10	Upper half	<2.94	<3.03	<2.98
S98T000277		Lower half	<3.04	<3.04	<3.04
S98T000274	226:11R	Upper half	<2.75	<2.73	<2.74
S98T000278		Lower half	<2.8	<2.74	<2.77
S98T000275	226:12	Upper half	<1.83	<2.03	<1.93
S98T000279		Lower half	<2.85	<2.84	<2.84
S98T000280	226:13	Whole	<2.81	<2.88	<2.84
S98T000276	226:14	Upper half	<1.96	<1.97	<1.96
S98T000281		Lower half	<3.04	<3.05	<3.04
S98T000510	226:15	Lower half	<2.93	<2.19	<2.56
S98T000544	228:2	Upper half	<2.98	<2.91	<2.95
S98T000545		Lower half	<2.86	<2.72	<2.79
S98T000542	228:3	Upper half	<2.83	<2.76	<2.8
S98T000543		Lower half	<2.76	<2.7	<2.73

Table B2-21. Tank 241-AX-101 Analytical Results: Beryllium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000540	228:4	Upper half	<2.82	<2.85	<2.84
S98T000541		Lower half	<2.88	<2.85	<2.87
S98T000576	228:5	Upper half	<2.94	<2.88	<2.91
S98T000593		Lower half	<2.85	<2.8	<2.83
S98T000607	228:6	Upper half	<2.58	<2.69	<2.63
S98T000630		Lower half	<2.85	<2.83	<2.84
S98T000631	228:7	Lower half	<2.83	<2.76	<2.8
S98T000632	228:8	Upper half	<2.75	<2.82	<2.79
S98T000633		Lower half	<2.92	<2.84	<2.88
S98T000594	228:9	Upper half	<2.93	<2.87	<2.9
S98T000595		Lower half	<2.94	<2.96	<2.95
S98T000634	228:10	Lower half	<2.89	<2.95	<2.92
S98T000774	228:11	Lower half	<2.96	<2.85	<2.91
S98T000795	228:12	Lower half	<2.96	<2.89	<2.92
S98T000796	228:13	Lower half	<2.99	<2.96	<2.98
S98T000797	228:14	Lower half	<2.81	<2.87	<2.84
S98T000798	228:15	Lower half	<2.8	<2.75	<2.77
S98T000675	Core 226	Solid composite	<2.85	<2.79	<2.82
S98T000998	Core 228	Solid composite	<2.74	<2.71	<2.73
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<2	<2	<2
S98T001009	226:8	Drainable liquid	<3	<3	<3
S98T000295	226:11R	Drainable liquid	<3	<3	<3
S98T000303	226:12	Drainable liquid	<3	<3	<3
S98T000304	226:13	Drainable liquid	<3	<3	<3
S98T000305	226:14	Drainable liquid	<3	<3	<3
S98T000514	226:15	Drainable liquid	<3	<3	<3
S98T000652	228:7	Drainable liquid	<3	<3	<3
S98T000658	228:10	Drainable liquid	<2	<2	<2
S98T000781	228:11	Drainable liquid	<2	<2	<2

Table B2-21. Tank 241-AX-101 Analytical Results: Beryllium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids (Cont'd)			**µg/mL**	**µg/mL**	**µg/mL**
S98T000812	228:12	Drainable liquid	<2	<2	<2
S98T000813	228:13	Drainable liquid	<3	<3	<3
S98T000814	228:14	Drainable liquid	<3	<3	<3
S98T000815	228:15	Drainable liquid	<3	<3	<3
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	<2.1	<2.09	<2.09
S98T000732		Lower half	<3.08	<3.04	<3.06
S98T000733	226:11R	Upper half	<1.85	<1.85	<1.85
S98T000734		Lower half	<2.04	<1.99	<2.02
S98T000735	226:14	Lower half	<3.01	<2.94	<2.97
S98T000736	228:5	Upper half	<2.77	<2.6	<2.69
S98T000737		Lower half	<2.71	<3.04	<2.88
S98T000777	228:11	Lower half	<2.77	<2.9	<2.84
S98T000803	228:14	Lower half	<3.15	<3.09	<3.12
S98T000729	Core 226	Solid composite	<2.88	<2.85	<2.87
S98T001000	Core 228	Solid composite	<3.02	<3.02	<3.02

Table B2-22. Tank 241-AX-101 Analytical Results: Bismuth (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**µg/g**	**µg/g**	**µg/g**
S98T000088	226:1	Lower half	<59.7	<60	<59.9
S98T000095	226:2	Upper half	<39.8	<39.7	<39.8
S98T000099		Lower half	<60.1	<59.7	<59.9
S98T000127	226:3	Upper half	<38.8	<39.5	<39.1
S98T000128		Lower half	<59.9	<59.9	<59.9
S98T000129	226:4	Upper half	<40.8	<41.2	<41
S98T000130		Lower half	<59.4	<59.5	<59.5

Table B2-22. Tank 241-AX-101 Analytical Results: Bismuth (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000131	226:5	Upper half	<58	<58.7	<58.4
S98T000132		Lower half	<59.9	<59.8	<59.8
S98T000159	226:6	Upper half	<59	<58.7	<58.9
S98T000160		Lower half	<59.5	<59.6	<59.5
S98T000161	226:7	Upper half	<58.6	<59	<58.8
S98T000162		Lower half	<58.1	<58.9	<58.5
S98T001005	226:8	Whole	<59.5	<41.9	<50.7
S98T000229	226:9	Upper half	<57.4	<56.5	<57
S98T000244		Lower half	<58.9	<58.4	<58.6
S98T000273	226:10	Upper half	<58.8	<60.7	<59.8
S98T000277		Lower half	<60.7	<60.8	<60.8
S98T000274	226:11R	Upper half	<55.1	<54.6	<54.9
S98T000278		Lower half	<56.1	<54.8	<55.5
S98T000275	226:12	Upper half	<36.7	<40.6	<38.7
S98T000279		Lower half	<56.9	<56.9	<56.9
S98T000280	226:13	Whole	<56.1	<57.7	<56.9
S98T000276	226:14	Upper half	<39.1	<39.4	<39.3
S98T000281		Lower half	<60.7	<61	<60.9
S98T000510	226:15	Lower half	<58.6	<43.8	<51.2
S98T000544	228:2	Upper half	<59.7	<58.2	<59
S98T000545		Lower half	<57.1	<54.3	<55.7
S98T000542	228:3	Upper half	<56.7	<55.2	<56
S98T000543		Lower half	<55.1	<54	<54.5
S98T000540	228:4	Upper half	<56.3	<57	<56.6
S98T000541		Lower half	<57.7	<57	<57.4
S98T000576	228:5	Upper half	<58.9	<57.5	<58.2
S98T000593		Lower half	<57	<56	<56.5
S98T000607	228:6	Upper half	<51.6	<53.7	<52.7
S98T000630		Lower half	<57.1	<56.5	<56.8
S98T000631	228:7	Lower half	<56.5	<55.1	<55.8

Table B2-22. Tank 241-AX-101 Analytical Results: Bismuth (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**μg/g**	**μg/g**	**μg/g**
S98T000632	228:8	Upper half	<55	<56.3	<55.6
S98T000633		Lower half	<58.4	<56.8	<57.6
S98T000594	228:9	Upper half	<58.5	<57.5	<58
S98T000595		Lower half	<58.8	<59.3	<59
S98T000634	228:10	Lower half	<57.8	<59	<58.4
S98T000774	228:11	Lower half	<59.3	<56.9	<58.1
S98T000795	228:12	Lower half	<59.2	<57.7	<58.5
S98T000796	228:13	Lower half	<59.8	<59.3	<59.5
S98T000797	228:14	Lower half	<56.2	<57.4	<56.8
S98T000798	228:15	Lower half	<56.1	<54.9	<55.5
S98T000675	Core 226	Solid composite	<56.9	<55.8	<56.3
S98T000998	Core 228	Solid composite	<54.8	<54.2	<54.5
Liquids			**μg/mL**	**μg/mL**	**μg/mL**
S98T000090	226:1	Drainable liquid	<40.1	<40.1	<40.1
S98T001009	226:8	Drainable liquid	<60.1	<60.1	<60.1
S98T000295	226:11R	Drainable liquid	<60.1	<60.1	<60.1
S98T000303	226:12	Drainable liquid	<60.1	<60.1	<60.1
S98T000304	226:13	Drainable liquid	<60.1	<60.1	<60.1
S98T000305	226:14	Drainable liquid	<60.1	<60.1	<60.1
S98T000514	226:15	Drainable liquid	<60.1	<60.1	<60.1
S98T000652	228:7	Drainable liquid	<60.1	<60.1	<60.1
S98T000658	228:10	Drainable liquid	<40.1	<40.1	<40.1
S98T000781	228:11	Drainable liquid	<40.1	<40.1	<40.1
S98T000812	228:12	Drainable liquid	<40.1	<40.1	<40.1
S98T000813	228:13	Drainable liquid	<60.1	<60.1	<60.1
S98T000814	228:14	Drainable liquid	<60.1	<60.1	<60.1
S98T000815	228:15	Drainable liquid	<60.1	<60.1	<60.1

Table B2-22. Tank 241-AX-101 Analytical Results: Bismuth (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			µg/g	µg/g	µg/g
S98T000731	226:5	Upper half	<41.9	<41.7	<41.8
S98T000732		Lower half	<61.6	<60.8	<61.2
S98T000733	226:11R	Upper half	<37	<37.1	<37
S98T000734		Lower half	<40.8	<39.8	<40.3
S98T000735	226:14	Lower half	<60.1	<58.8	<59.5
S98T000736	228:5	Upper half	<55.4	<51.9	<53.6
S98T000737		Lower half	<54.1	<60.7	<57.4
S98T000777	228:11	Lower half	<55.4	<58.1	<56.8
S98T000803	228:14	Lower half	<62.9	<61.9	<62.4
S98T000729	Core 226	Solid composite	<57.6	<57	<57.3
S98T001000	Core 228	Solid composite	<60.3	<60.4	<60.3

Table B2-23. Tank 241-AX-101 Analytical Results: Boron (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			µg/g	µg/g	µg/g
S98T000088	226:1	Lower half	108	114	111
S98T000095	226:2	Upper half	78.2	115	96.6[QC:e]
S98T000099		Lower half	127	99	113[QC:e]
S98T000127	226:3	Upper half	72.3	47.1	59.7[QC:e]
S98T000128		Lower half	84.9	134	109[QC:e]
S98T000129	226:4	Upper half	62.9	112	87.5[QC:e]
S98T000130		Lower half	174	102	138[QC:e]
S98T000131	226:5	Upper half	67.8	70.5	69.2
S98T000132		Lower half	116	59.9	88[QC:e]
S98T000159	226:6	Upper half	89.1	79.1	84.1
S98T000160		Lower half	179	93.5	136[QC:e]
S98T000161	226:7	Upper half	88.7	<29.5	<59.1[QC:e]
S98T000162		Lower half	88	134	111[QC:e]

Table B2-23. Tank 241-AX-101 Analytical Results: Boron (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**μg/g**	**μg/g**	**μg/g**
S98T001005	226:8	Whole	92.4	65.7	79.1[QC:e]
S98T000229	226:9	Upper half	33.6	35.2	34.4
S98T000244		Lower half	98.4	118	108
S98T000273	226:10	Upper half	45.2	119	82.1[QC:e]
S98T000277		Lower half	56.4	65.3	60.8
S98T000274	226:11R	Upper half	34.7	46	40.4[QC:e]
S98T000278		Lower half	125	102	114[QC:e]
S98T000275	226:12	Upper half	90.4	102	96.2
S98T000279		Lower half	122	35.4	78.7[QC:e]
S98T000280	226:13	Whole	124	33.4	78.7[QC:e]
S98T000276	226:14	Upper half	103	35	69[QC:e]
S98T000281		Lower half	125	104	115
S98T000510	226:15	Lower half	110	131	121
S98T000544	228:2	Upper half	104	75.8	89.9[QC:e]
S98T000545		Lower half	172	109	141[QC:e]
S98T000542	228:3	Upper half	78.7	74.3	76.5
S98T000543		Lower half	137	97.5	117[QC:e]
S98T000540	228:4	Upper half	77.7	138	108[QC:e]
S98T000541		Lower half	161	121	141[QC:e]
S98T000576	228:5	Upper half	168	146	157
S98T000593		Lower half	98.1	35.6	66.8[QC:e]
S98T000607	228:6	Upper half	96	84.9	90.5
S98T000630		Lower half	103	105	104
S98T000631	228:7	Lower half	85.6	109	97.3[QC:e]
S98T000632	228:8	Upper half	80.5	90	85.3
S98T000633		Lower half	94.3	149	122[QC:e]
S98T000594	228:9	Upper half	95.3	142	119[QC:e]
S98T000595		Lower half	155	40.9	98[QC:e]
S98T000634	228:10	Lower half	176	190	183
S98T000774	228:11	Lower half	38.6	108	73.3[QC:e]

Table B2-23. Tank 241-AX-101 Analytical Results: Boron (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000795	228:12	Lower half	39.4	113	76.2[QC:e]
S98T000796	228:13	Lower half	<29.9	145	<87.5[QC:e]
S98T000797	228:14	Lower half	172	100	136[QC:e]
S98T000798	228:15	Lower half	31.9	129	80.5[QC:e]
S98T000675	Core 226	Solid composite	136	194	165[QC:e]
S98T000998	Core 228	Solid composite	173	137	155[QC:e]
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<20.1	<20.1	<20.1
S98T001009	226:8	Drainable liquid	<30.1	<30.1	<30.1
S98T000295	226:11R	Drainable liquid	64	61.7	62.9
S98T000303	226:12	Drainable liquid	62.2	63.3	62.8
S98T000304	226:13	Drainable liquid	50.1	51.4	50.8
S98T000305	226:14	Drainable liquid	54	54.2	54.1
S98T000514	226:15	Drainable liquid	55.2	56.5	55.9
S98T000652	228:7	Drainable liquid	49	51	50
S98T000658	228:10	Drainable liquid	45.5	45.7	45.6
S98T000781	228:11	Drainable liquid	46.1	48.2	47.2
S98T000812	228:12	Drainable liquid	47.1	46.9	47
S98T000813	228:13	Drainable liquid	49.3	52.8	51
S98T000814	228:14	Drainable liquid	60.5	58.7	59.6
S98T000815	228:15	Drainable liquid	64.9	80.5	72.7[QC:e]
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	561	521	541
S98T000732		Lower half	785	539	662[QC:e]
S98T000733	226:11R	Upper half	750	507	629[QC:e]
S98T000734		Lower half	622	571	597
S98T000735	226:14	Lower half	535	373	454[QC:e]
S98T000736	228:5	Upper half	583	522	553
S98T000737		Lower half	673	504	589[QC:e]
S98T000777	228:11	Lower half	681	618	650

Table B2-23. Tank 241-AX-101 Analytical Results: Boron (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest (Cont'd)			µg/g	µg/g	µg/g
S98T000803	228:14	Lower half	676	825	751
S98T000729	Core 226	Solid composite	316	640	478[QC:e]
S98T001000	Core 228	Solid composite	555	523	539

Table B2-24. Tank 241-AX-101 Analytical Results: Cadmium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			µg/g	µg/g	µg/g
S98T000088	226:1	Lower half	4.16	5.7	4.93[QC:e]
S98T000095	226:2	Upper half	4.52	4.89	4.71
S98T000099		Lower half	5.69	6.17	5.93
S98T000127	226:3	Upper half	5.25	7.01	6.13[QC:e]
S98T000128		Lower half	4.66	4.68	4.67
S98T000129	226:4	Upper half	7.8	7.63	7.71
S98T000130		Lower half	8.24	7.85	8.04
S98T000131	226:5	Upper half	8.4	8.78	8.59
S98T000132		Lower half	10.6	9.91	10.3
S98T000159	226:6	Upper half	9.43	9.56	9.5
S98T000160		Lower half	9.26	9.36	9.31
S98T000161	226:7	Upper half	9.52	9.14	9.33
S98T000162		Lower half	8.52	9.74	9.13
S98T001005	226:8	Whole	44.8	29.3	37[QC:e]
S98T000229	226:9	Upper half	10.3	10.2	10.3
S98T000244		Lower half	9.86	10.7	10.3
S98T000273	226:10	Upper half	11.4	12.2	11.8
S98T000277		Lower half	11.8	14.3	13.1
S98T000274	226:11R	Upper half	<2.75	<2.73	<2.74
S98T000278		Lower half	<2.8	<2.74	<2.77

Table B2-24. Tank 241-AX-101 Analytical Results: Cadmium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000275	226:12	Upper half	<1.83	<2.03	<1.93
S98T000279		Lower half	<2.85	<2.84	<2.84
S98T000280	226:13	Whole	<2.81	<2.88	<2.84
S98T000276	226:14	Upper half	<1.96	<1.97	<1.96
S98T000281		Lower half	<3.04	<3.05	<3.04
S98T000510	226:15	Lower half	<2.93	<2.19	<2.56
S98T000544	228:2	Upper half	7.86	7.36	7.61
S98T000545		Lower half	7.5	7.74	7.62
S98T000542	228:3	Upper half	8.73	9.2	8.96
S98T000543		Lower half	8.96	9.33	9.14
S98T000540	228:4	Upper half	8.75	9.88	9.32
S98T000541		Lower half	9.41	9.44	9.43
S98T000576	228:5	Upper half	8.81	9.42	9.12
S98T000593		Lower half	7.98	9.14	8.56
S98T000607	228:6	Upper half	8.39	8.97	8.68
S98T000630		Lower half	7.76	7.74	7.75
S98T000631	228:7	Lower half	6.77	6.96	6.87
S98T000632	228:8	Upper half	11.7	11.5	11.6
S98T000633		Lower half	16.8	15.5	16.1
S98T000594	228:9	Upper half	21.9	18.6	20.3
S98T000595		Lower half	25.1	26	25.6
S98T000634	228:10	Lower half	8.24	7.51	7.88
S98T000774	228:11	Lower half	<2.96	<2.85	<2.91
S98T000795	228:12	Lower half	<2.96	<2.89	<2.92
S98T000796	228:13	Lower half	<2.99	<2.96	<2.98
S98T000797	228:14	Lower half	<2.81	<2.87	<2.84
S98T000798	228:15	Lower half	<2.8	<2.75	<2.77
S98T000675	Core 226	Solid composite	9.42	9.89	9.66
S98T000998	Core 228	Solid composite	7.04	9.17	8.11[QC:e]

Table B2-24. Tank 241-AX-101 Analytical Results: Cadmium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<2	<2	<2
S98T001009	226:8	Drainable liquid	<3	<3	<3
S98T000295	226:11R	Drainable liquid	<3	<3	<3
S98T000303	226:12	Drainable liquid	<3	<3	<3
S98T000304	226:13	Drainable liquid	<3	<3	<3
S98T000305	226:14	Drainable liquid	<3	<3	<3
S98T000514	226:15	Drainable liquid	<3	<3	<3
S98T000652	228:7	Drainable liquid	<3	<3	<3
S98T000658	228:10	Drainable liquid	<2	<2	<2
S98T000781	228:11	Drainable liquid	<2	<2	<2
S98T000812	228:12	Drainable liquid	<2	2.24	<2.12
S98T000813	228:13	Drainable liquid	<3	<3	<3
S98T000814	228:14	Drainable liquid	<3	<3	<3
S98T000815	228:15	Drainable liquid	3.42	3.68	3.55
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	<2.1	<2.09	<2.09
S98T000732		Lower half	<3.08	<3.04	<3.06
S98T000733	226:11R	Upper half	<1.85	<1.85	<1.85
S98T000734		Lower half	<2.04	<1.99	<2.02
S98T000735	226:14	Lower half	<3.01	<2.94	<2.97
S98T000736	228:5	Upper half	<2.77	<2.6	<2.69
S98T000737		Lower half	<2.71	<3.04	<2.88
S98T000777	228:11	Lower half	<2.77	<2.9	<2.84
S98T000803	228:14	Lower half	<3.15	<3.09	<3.12
S98T000729	Core 226	Solid composite	<2.88	<2.85	<2.87
S98T001000	Core 228	Solid composite	<3.02	<3.02	<3.02

Table B2-25. Tank 241-AX-101 Analytical Results: Calcium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**µg/g**	**µg/g**	**µg/g**
S98T000088	226:1	Lower half	293	311	302
S98T000095	226:2	Upper half	387	394	391
S98T000099		Lower half	410	407	409
S98T000127	226:3	Upper half	271	282	277
S98T000128		Lower half	256	256	256
S98T000129	226:4	Upper half	296	278	287
S98T000130		Lower half	357	367	362
S98T000131	226:5	Upper half	307	315	311
S98T000132		Lower half	339	465	402[QC:e]
S98T000159	226:6	Upper half	264	256	260
S98T000160		Lower half	357	566	462[QC:e]
S98T000161	226:7	Upper half	244	254	249
S98T000162		Lower half	378	324	351
S98T001005	226:8	Whole	1,290	851	1,070[QC:b,e]
S98T000229	226:9	Upper half	248	282	265
S98T000244		Lower half	245	255	250
S98T000273	226:10	Upper half	247	243	245
S98T000277		Lower half	186	270	228[QC:e]
S98T000274	226:11R	Upper half	59.7	94.9	77.3[QC:e]
S98T000278		Lower half	90	99.5	94.8
S98T000275	226:12	Upper half	57	54	55.5
S98T000279		Lower half	117	69.6	93.3[QC:e]
S98T000280	226:13	Whole	103	73.5	88.3[QC:e]
S98T000276	226:14	Upper half	70	77.5	73.8
S98T000281		Lower half	162	164	163
S98T000510	226:15	Lower half	167	176	172[QC:b]
S98T000544	228:2	Upper half	540	487	514
S98T000545		Lower half	375	433	404
S98T000542	228:3	Upper half	409	331	370[QC:e]
S98T000543		Lower half	348	1,190	769[QC:e]

Table B2-25. Tank 241-AX-101 Analytical Results: Calcium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000540	228:4	Upper half	285	488	387[QC:e]
S98T000541		Lower half	292	303	298
S98T000576	228:5	Upper half	307	345	326
S98T000593		Lower half	279	312	296
S98T000607	228:6	Upper half	286	290	288
S98T000630		Lower half	328	297	313
S98T000631	228:7	Lower half	235	247	241
S98T000632	228:8	Upper half	287	286	287
S98T000633		Lower half	290	266	278
S98T000594	228:9	Upper half	280	321	301
S98T000595		Lower half	190	281	236[QC:e]
S98T000634	228:10	Lower half	154	62.4	108[QC:e]
S98T000774	228:11	Lower half	61.7	72.7	67.2
S98T000795	228:12	Lower half	93.9	63.4	78.7[QC:e]
S98T000796	228:13	Lower half	65.2	<59.3	<62.3
S98T000797	228:14	Lower half	<56.2	58.5	<57.4
S98T000798	228:15	Lower half	62.5	<54.9	<58.7
S98T000675	Core 226	Solid composite	531	528	530
S98T000998	Core 228	Solid composite	204	223	214
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<40.1	<40.1	<40.1
S98T001009	226:8	Drainable liquid	<60.1	<60.1	<60.1
S98T000295	226:11R	Drainable liquid	<60.1	<60.1	<60.1
S98T000303	226:12	Drainable liquid	<60.1	<60.1	<60.1
S98T000304	226:13	Drainable liquid	<60.1	<60.1	<60.1
S98T000305	226:14	Drainable liquid	<60.1	<60.1	<60.1
S98T000514	226:15	Drainable liquid	<60.1	<60.1	<60.1
S98T000652	228:7	Drainable liquid	<60.1	<60.1	<60.1
S98T000658	228:10	Drainable liquid	<40.1	<40.1	<40.1
S98T000781	228:11	Drainable liquid	<40.1	<40.1	<40.1

Table B2-25. Tank 241-AX-101 Analytical Results: Calcium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids (Cont'd)			**µg/mL**	**µg/mL**	**µg/mL**
S98T000812	228:12	Drainable liquid	<40.1	<40.1	<40.1
S98T000813	228:13	Drainable liquid	<60.1	<60.1	<60.1
S98T000814	228:14	Drainable liquid	<60.1	<60.1	<60.1
S98T000815	228:15	Drainable liquid	<60.1	<60.1	<60.1
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	<41.9	<41.7	<41.8
S98T000732		Lower half	<61.6	<60.8	<61.2
S98T000733	226:11R	Upper half	<37	<37.1	<37
S98T000734		Lower half	<40.8	<39.8	<40.3
S98T000735	226:14	Lower half	<60.1	<58.8	<59.5
S98T000736	228:5	Upper half	<55.4	<51.9	<53.6
S98T000737		Lower half	<54.1	<60.7	<57.4
S98T000777	228:11	Lower half	<55.4	<58.1	<56.8
S98T000803	228:14	Lower half	<62.9	<61.9	<62.4
S98T000729	Core 226	Solid composite	<57.6	<57	<57.3
S98T001000	Core 228	Solid composite	<60.3	<60.4	<60.3

Table B2-26. Tank 241-AX-101 Analytical Results: Cerium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**µg/g**	**µg/g**	**µg/g**
S98T000088	226:1	Lower half	<59.7	<60	<59.9
S98T000095	226:2	Upper half	<39.8	<39.7	<39.8
S98T000099		Lower half	<60.1	<59.7	<59.9
S98T000127	226:3	Upper half	<38.8	<39.5	<39.1
S98T000128		Lower half	<59.9	<59.9	<59.9
S98T000129	226:4	Upper half	<40.8	<41.2	<41
S98T000130		Lower half	<59.4	<59.5	<59.5

Table B2-26. Tank 241-AX-101 Analytical Results: Cerium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000131	226:5	Upper half	<58	<58.7	<58.4
S98T000132		Lower half	<59.9	<59.8	<59.8
S98T000159	226:6	Upper half	<59	<58.7	<58.9
S98T000160		Lower half	<59.5	<59.6	<59.5
S98T000161	226:7	Upper half	<58.6	<59	<58.8
S98T000162		Lower half	<58.1	<58.9	<58.5
S98T001005	226:8	Whole	<59.5	<41.9	<50.7
S98T000229	226:9	Upper half	<57.4	<56.5	<57
S98T000244		Lower half	<58.9	<58.4	<58.6
S98T000273	226:10	Upper half	<58.8	<60.7	<59.8
S98T000277		Lower half	<60.7	<60.8	<60.8
S98T000274	226:11R	Upper half	<55.1	<54.6	<54.9
S98T000278		Lower half	<56.1	<54.8	<55.5
S98T000275	226:12	Upper half	<36.7	<40.6	<38.7
S98T000279		Lower half	<56.9	<56.9	<56.9
S98T000280	226:13	Whole	<56.1	<57.7	<56.9
S98T000276	226:14	Upper half	<39.1	<39.4	<39.3
S98T000281		Lower half	<60.7	<61	<60.9
S98T000510	226:15	Lower half	<58.6	<43.8	<51.2
S98T000544	228:2	Upper half	<59.7	<58.2	<59
S98T000545		Lower half	<57.1	<54.3	<55.7
S98T000542	228:3	Upper half	<56.7	<55.2	<56
S98T000543		Lower half	<55.1	<54	<54.5
S98T000540	228:4	Upper half	<56.3	<57	<56.6
S98T000541		Lower half	<57.7	<57	<57.4
S98T000576	228:5	Upper half	<58.9	<57.5	<58.2
S98T000593		Lower half	<57	<56	<56.5
S98T000607	228:6	Upper half	<51.6	<53.7	<52.7
S98T000630		Lower half	<57.1	<56.5	<56.8
S98T000631	228:7	Lower half	<56.5	<55.1	<55.8

Table B2-26. Tank 241-AX-101 Analytical Results: Cerium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000632	228:8	Upper half	<55	<56.3	<55.6
S98T000633		Lower half	<58.4	<56.8	<57.6
S98T000594	228:9	Upper half	<58.5	<57.5	<58
S98T000595		Lower half	<58.8	<59.3	<59
S98T000634	228:10	Lower half	<57.8	<59	<58.4
S98T000774	228:11	Lower half	<59.3	<56.9	<58.1
S98T000795	228:12	Lower half	<59.2	<57.7	<58.5
S98T000796	228:13	Lower half	<59.8	<59.3	<59.5
S98T000797	228:14	Lower half	<56.2	<57.4	<56.8
S98T000798	228:15	Lower half	<56.1	<54.9	<55.5
S98T000675	Core 226	Solid composite	<56.9	<55.8	<56.3
S98T000998	Core 228	Solid composite	<54.8	<54.2	<54.5
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<40.1	<40.1	<40.1
S98T001009	226:8	Drainable liquid	<60.1	<60.1	<60.1
S98T000295	226:11R	Drainable liquid	<60.1	<60.1	<60.1
S98T000303	226:12	Drainable liquid	<60.1	<60.1	<60.1
S98T000304	226:13	Drainable liquid	<60.1	<60.1	<60.1
S98T000305	226:14	Drainable liquid	<60.1	<60.1	<60.1
S98T000514	226:15	Drainable liquid	<60.1	<60.1	<60.1
S98T000652	228:7	Drainable liquid	<60.1	<60.1	<60.1
S98T000658	228:10	Drainable liquid	<40.1	<40.1	<40.1
S98T000781	228:11	Drainable liquid	<40.1	<40.1	<40.1
S98T000812	228:12	Drainable liquid	<40.1	<40.1	<40.1
S98T000813	228:13	Drainable liquid	<60.1	<60.1	<60.1
S98T000814	228:14	Drainable liquid	<60.1	<60.1	<60.1
S98T000815	228:15	Drainable liquid	<60.1	<60.1	<60.1
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	<41.9	<41.7	<41.8
S98T000732		Lower half	<61.6	<60.8	<61.2

Table B2-26. Tank 241-AX-101 Analytical Results: Cerium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000733	226:11R	Upper half	<37	<37.1	<37
S98T000734		Lower half	<40.8	<39.8	<40.3
S98T000735	226:14	Lower half	<60.1	<58.8	<59.5
S98T000736	228:5	Upper half	<55.4	<51.9	<53.6
S98T000737		Lower half	<54.1	<60.7	<57.4
S98T000777	228:11	Lower half	<55.4	<58.1	<56.8
S98T000803	228:14	Lower half	<62.9	<61.9	<62.4
S98T000729	Core 226	Solid composite	<57.6	<57	<57.3
S98T001000	Core 228	Solid composite	<60.3	<60.4	<60.3

Table B2-27. Tank 241-AX-101 Analytical Results: Chromium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**µg/g**	**µg/g**	**µg/g**
S98T000088	226:1	Lower half	236	226	231
S98T000095	226:2	Upper half	1,070	1,100	1,090
S98T000099		Lower half	1,380	1,410	1,400
S98T000127	226:3	Upper half	1,460	1,840	1,650[QC:e]
S98T000128		Lower half	1,310	1,290	1,300
S98T000129	226:4	Upper half	2,070	1,980	2,030
S98T000130		Lower half	2,120	2,320	2,220
S98T000131	226:5	Upper half	2,260	2,310	2,290
S98T000132		Lower half	2,660	2,670	2,670
S98T000159	226:6	Upper half	2,470	2,460	2,470
S98T000160		Lower half	2,360	2,450	2,410
S98T000161	226:7	Upper half	2,410	2,500	2,460
S98T000162		Lower half	2,420	2,550	2,490
S98T001005	226:8	Whole	11,700	7,670	9,690[QC:e]
S98T000229	226:9	Upper half	2,380	2,370	2,380
S98T000244		Lower half	2,260	2,480	2,370

Table B2-27. Tank 241-AX-101 Analytical Results: Chromium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000273	226:10	Upper half	2,650	2,770	2,710
S98T000277		Lower half	2,690	3,280	2,990
S98T000274	226:11R	Upper half	62.6	63.5	63
S98T000278		Lower half	56.2	59.2	57.7
S98T000275	226:12	Upper half	37.6	38.5	38
S98T000279		Lower half	42.5	51.2	46.9
S98T000280	226:13	Whole	43.2	45	44.1
S98T000276	226:14	Upper half	297	323	310
S98T000281		Lower half	65.7	63.7	64.7
S98T000510	226:15	Lower half	323	200	262[QC:e]
S98T000544	228:2	Upper half	1,660	1,630	1,650
S98T000545		Lower half	1,820	1,650	1,740
S98T000542	228:3	Upper half	2,090	2,250	2,170
S98T000543		Lower half	2,140	2,300	2,220
S98T000540	228:4	Upper half	2,310	2,600	2,460
S98T000541		Lower half	2,240	2,280	2,260
S98T000576	228:5	Upper half	2,230	2,330	2,280
S98T000593		Lower half	2,030	2,290	2,160
S98T000607	228:6	Upper half	2,130	2,280	2,210
S98T000630		Lower half	2,170	2,120	2,150
S98T000631	228:7	Lower half	1,860	1,900	1,880
S98T000632	228:8	Upper half	2,830	2,870	2,850
S98T000633		Lower half	3,780	3,400	3,590
S98T000594	228:9	Upper half	4,700	4,080	4,390
S98T000595		Lower half	4,800	4,980	4,890
S98T000634	228:10	Lower half	1,480	1,410	1,450
S98T000774	228:11	Lower half	42	43.1	42.5
S98T000795	228:12	Lower half	35	39.6	37.3
S98T000796	228:13	Lower half	32.1	39.4	35.8[QC:e]
S98T000797	228:14	Lower half	47.3	48.2	47.8
S98T000798	228:15	Lower half	110	74.5	92.3[QC:e]

Table B2-27. Tank 241-AX-101 Analytical Results: Chromium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000675	Core 226	Solid composite	2,190	2,180	2,190
S98T000998	Core 228	Solid composite	1,780	1,990	1,890
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	110	110	110
S98T001009	226:8	Drainable liquid	27.5	42.8	35.1[QC:e]
S98T000295	226:11R	Drainable liquid	91.7	87.4	89.6
S98T000303	226:12	Drainable liquid	86.2	86.9	86.6
S98T000304	226:13	Drainable liquid	73.4	72.6	73
S98T000305	226:14	Drainable liquid	82.7	78.4	80.6
S98T000514	226:15	Drainable liquid	87.7	89.8	88.8
S98T000652	228:7	Drainable liquid	101	104	103
S98T000658	228:10	Drainable liquid	74	76.6	75.3
S98T000781	228:11	Drainable liquid	72.4	74.3	73.3
S98T000812	228:12	Drainable liquid	78.9	77.3	78.1
S98T000813	228:13	Drainable liquid	75.5	80.4	78
S98T000814	228:14	Drainable liquid	86.6	92.6	89.6
S98T000815	228:15	Drainable liquid	98.6	119	109
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	40.7	40.1	40.4
S98T000732		Lower half	37.1	37.1	37.1
S98T000733	226:11R	Upper half	39.5	40.7	40.1
S98T000734		Lower half	42.6	41.3	42
S98T000735	226:14	Lower half	26.9	25.7	26.3
S98T000736	228:5	Upper half	53.6	51.6	52.6
S98T000737		Lower half	52.5	50.3	51.4
S98T000777	228:11	Lower half	33.5	33.3	33.4
S98T000803	228:14	Lower half	29.5	33.1	31.3
S98T000729	Core 226	Solid composite	90.3	81	85.7
S98T001000	Core 228	Solid composite	86.7	85.2	86

Table B2-28. Tank 241-AX-101 Analytical Results: Cobalt (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			μg/g	μg/g	μg/g
S98T000088	226:1	Lower half	<11.9	<12	<11.9
S98T000095	226:2	Upper half	<7.97	<7.94	<7.96
S98T000099		Lower half	<12	<11.9	<11.9
S98T000127	226:3	Upper half	<7.76	<7.9	<7.83
S98T000128		Lower half	<12	<12	<12
S98T000129	226:4	Upper half	<8.16	<8.23	<8.2
S98T000130		Lower half	<11.9	<11.9	<11.9
S98T000131	226:5	Upper half	<11.6	<11.7	<11.6
S98T000132		Lower half	<12	<12	<12
S98T000159	226:6	Upper half	<11.8	<11.7	<11.8
S98T000160		Lower half	<11.9	<11.9	<11.9
S98T000161	226:7	Upper half	<11.7	<11.8	<11.8
S98T000162		Lower half	<11.6	<11.8	<11.7
S98T001005	226:8	Whole	<11.9	<8.38	<10.1
S98T000229	226:9	Upper half	<11.5	<11.3	<11.4
S98T000244		Lower half	<11.8	<11.7	<11.8
S98T000273	226:10	Upper half	<11.8	<12.1	<11.9
S98T000277		Lower half	<12.1	<12.2	<12.1
S98T000274	226:11R	Upper half	<11	<10.9	<10.9
S98T000278		Lower half	<11.2	<11	<11.1
S98T000275	226:12	Upper half	<7.34	<8.12	<7.73
S98T000279		Lower half	<11.4	<11.4	<11.4
S98T000280	226:13	Whole	<11.2	<11.5	<11.3
S98T000276	226:14	Upper half	<7.82	<7.88	<7.85
S98T000281		Lower half	<12.1	<12.2	<12.1
S98T000510	226:15	Lower half	<11.7	<8.76	<10.2[QC:c]
S98T000544	228:2	Upper half	<11.9	<11.6	<11.8
S98T000545		Lower half	<11.4	<10.9	<11.2
S98T000542	228:3	Upper half	<11.3	<11	<11.2
S98T000543		Lower half	<11	<10.8	<10.9

Table B2-28. Tank 241-AX-101 Analytical Results: Cobalt (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000540	228:4	Upper half	<11.3	<11.4	<11.4
S98T000541		Lower half	<11.5	<11.4	<11.4
S98T000576	228:5	Upper half	<11.8	<11.5	<11.7
S98T000593		Lower half	<11.4	<11.2	<11.3
S98T000607	228:6	Upper half	<10.3	<10.7	<10.5
S98T000630		Lower half	<11.4	<11.3	<11.4
S98T000631	228:7	Lower half	<11.3	<11	<11.2
S98T000632	228:8	Upper half	<11	<11.3	<11.2
S98T000633		Lower half	<11.7	<11.4	<11.6
S98T000594	228:9	Upper half	<11.7	<11.5	<11.6
S98T000595		Lower half	<11.8	<11.9	<11.9
S98T000634	228:10	Lower half	<11.6	<11.8	<11.7
S98T000774	228:11	Lower half	<11.9	<11.4	<11.7
S98T000795	228:12	Lower half	<11.8	<11.5	<11.7
S98T000796	228:13	Lower half	<12	<11.9	<11.9
S98T000797	228:14	Lower half	<11.2	<11.5	<11.3
S98T000798	228:15	Lower half	<11.2	<11	<11.1
S98T000675	Core 226	Solid composite	<11.4	<11.2	<11.3
S98T000998	Core 228	Solid composite	<11	<10.8	<10.9
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<8.02	<8.02	<8.02
S98T001009	226:8	Drainable liquid	<12	<12	<12
S98T000295	226:11R	Drainable liquid	<12	<12	<12
S98T000303	226:12	Drainable liquid	<12	<12	<12
S98T000304	226:13	Drainable liquid	<12	<12	<12
S98T000305	226:14	Drainable liquid	<12	<12	<12
S98T000514	226:15	Drainable liquid	<12	<12	<12
S98T000652	228:7	Drainable liquid	<12	<12	<12
S98T000658	228:10	Drainable liquid	<8.02	<8.02	<8.02
S98T000781	228:11	Drainable liquid	<8.02	<8.02	<8.02

Table B2-28. Tank 241-AX-101 Analytical Results: Cobalt (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids (Cont'd)			**µg/mL**	**µg/mL**	**µg/mL**
S98T000812	228:12	Drainable liquid	<8.02	<8.02	<8.02
S98T000813	228:13	Drainable liquid	<12	<12	<12
S98T000814	228:14	Drainable liquid	<12	<12	<12
S98T000815	228:15	Drainable liquid	<12	<12	<12
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	<8.39	<8.35	<8.37
S98T000732		Lower half	<12.3	<12.2	<12.3
S98T000733	226:11R	Upper half	<7.4	<7.41	<7.41
S98T000734		Lower half	<8.16	<7.96	<8.06
S98T000735	226:14	Lower half	<12	<11.8	<11.9
S98T000736	228:5	Upper half	<11.1	<10.4	<10.8
S98T000737		Lower half	<10.8	<12.1	<11.4
S98T000777	228:11	Lower half	<11.1	<11.6	<11.3
S98T000803	228:14	Lower half	<12.6	<12.4	<12.5
S98T000729	Core 226	Solid composite	<11.5	<11.4	<11.4
S98T001000	Core 228	Solid composite	<12.1	<12.1	<12.1

Table B2-29. Tank 241-AX-101 Analytical Results: Copper (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**µg/g**	**µg/g**	**µg/g**
S98T000088	226:1	Lower half	<5.97	<6	<5.98
S98T000095	226:2	Upper half	<3.98	<3.97	<3.98
S98T000099		Lower half	<6.01	<5.97	<5.99
S98T000127	226:3	Upper half	<3.88	<3.95	<3.92
S98T000128		Lower half	<5.99	<5.99	<5.99
S98T000129	226:4	Upper half	<4.08	<4.12	<4.1
S98T000130		Lower half	<5.94	<5.95	<5.95

Table B2-29. Tank 241-AX-101 Analytical Results: Copper (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			µg/g	µg/g	µg/g
S98T000131	226:5	Upper half	<5.8	<5.87	<5.84
S98T000132		Lower half	<5.99	<5.98	<5.99
S98T000159	226:6	Upper half	<5.9	<5.87	<5.88
S98T000160		Lower half	<5.95	<5.96	<5.96
S98T000161	226:7	Upper half	<5.86	<5.9	<5.88
S98T000162		Lower half	<5.81	<5.89	<5.85
S98T001005	226:8	Whole	<5.95	<4.19	<5.07
S98T000229	226:9	Upper half	<5.74	<5.65	<5.7
S98T000244		Lower half	<5.89	<5.84	<5.87
S98T000273	226:10	Upper half	<5.88	<6.07	<5.97
S98T000277		Lower half	<6.07	<6.08	<6.08
S98T000274	226:11R	Upper half	<5.51	<5.46	<5.48
S98T000278		Lower half	6.21	<5.48	<5.85
S98T000275	226:12	Upper half	4.16	<4.06	<4.11
S98T000279		Lower half	<5.69	<5.69	<5.69
S98T000280	226:13	Whole	<5.61	<5.77	<5.69
S98T000276	226:14	Upper half	4.16	4.45	4.3
S98T000281		Lower half	<6.07	<6.1	<6.08
S98T000510	226:15	Lower half	<5.86	6.69	<6.28
S98T000544	228:2	Upper half	10.7	9.54	10.1
S98T000545		Lower half	<5.71	<5.43	<5.57
S98T000542	228:3	Upper half	<5.67	<5.52	<5.59
S98T000543		Lower half	<5.51	<5.4	<5.46
S98T000540	228:4	Upper half	<5.63	<5.7	<5.67
S98T000541		Lower half	<5.77	<5.7	<5.73
S98T000576	228:5	Upper half	<5.89	<5.75	<5.82
S98T000593		Lower half	<5.7	<5.6	<5.65
S98T000607	228:6	Upper half	<5.16	<5.37	<5.27
S98T000630		Lower half	<5.71	<5.65	<5.68
S98T000631	228:7	Lower half	<5.65	<5.51	<5.58

Table B2-29. Tank 241-AX-101 Analytical Results: Copper (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000632	228:8	Upper half	<5.5	<5.63	<5.56
S98T000633		Lower half	<5.84	<5.68	<5.76
S98T000594	228:9	Upper half	<5.85	<5.75	<5.8
S98T000595		Lower half	<5.88	<5.93	<5.9
S98T000634	228:10	Lower half	<5.78	6.22	<6
S98T000774	228:11	Lower half	<5.93	<5.69	<5.81
S98T000795	228:12	Lower half	<5.92	<5.77	<5.84
S98T000796	228:13	Lower half	<5.98	<5.93	<5.96
S98T000797	228:14	Lower half	6.13	<5.74	<5.94
S98T000798	228:15	Lower half	<5.61	<5.49	<5.55
S98T000675	Core 226	Solid composite	<5.69	<5.58	<5.63
S98T000998	Core 228	Solid composite	<5.48	<5.42	<5.45
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<4.01	<4.01	<4.01
S98T001009	226:8	Drainable liquid	<6.01	<6.01	<6.01
S98T000295	226:11R	Drainable liquid	<6.01	<6.01	<6.01
S98T000303	226:12	Drainable liquid	<6.01	<6.01	<6.01
S98T000304	226:13	Drainable liquid	<6.01	<6.01	<6.01
S98T000305	226:14	Drainable liquid	<6.01	<6.01	<6.01
S98T000514	226:15	Drainable liquid	<6.01	<6.01	<6.01
S98T000652	228:7	Drainable liquid	<6.01	<6.01	<6.01
S98T000658	228:10	Drainable liquid	<4.01	<4.01	<4.01
S98T000781	228:11	Drainable liquid	<4.01	<4.01	<4.01
S98T000812	228:12	Drainable liquid	<4.01	4.04	<4.03
S98T000813	228:13	Drainable liquid	<6.01	<6.01	<6.01
S98T000814	228:14	Drainable liquid	<6.01	<6.01	<6.01
S98T000815	228:15	Drainable liquid	<6.01	<6.01	<6.01

Table B2-29. Tank 241-AX-101 Analytical Results: Copper (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			µg/g	µg/g	µg/g
S98T000731	226:5	Upper half	<4.19	<4.17	<4.18
S98T000732		Lower half	<6.16	<6.08	<6.12
S98T000733	226:11R	Upper half	<3.7	<3.71	<3.71
S98T000734		Lower half	<4.08	<3.98	<4.03
S98T000735	226:14	Lower half	<6.01	<5.88	<5.95
S98T000736	228:5	Upper half	<5.54	<5.19	<5.37
S98T000737		Lower half	<5.41	<6.07	<5.74
S98T000777	228:11	Lower half	<5.54	<5.81	<5.67
S98T000803	228:14	Lower half	<6.29	<6.19	<6.24
S98T000729	Core 226	Solid composite	<5.76	<5.7	<5.73
S98T001000	Core 228	Solid composite	<6.03	<6.04	<6.04

Table B2-30. Tank 241-AX-101 Analytical Results: Iron (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			µg/g	µg/g	µg/g
S98T000088	226:1	Lower half	14,900	41,600	28,300[QC:d,e,h]
S98T000095	226:2	Upper half	151	165	158
S98T000099		Lower half	149	147	148
S98T000127	226:3	Upper half	125	179	152[QC:e]
S98T000128		Lower half	121	101	111
S98T000129	226:4	Upper half	172	166	169
S98T000130		Lower half	183	186	185
S98T000131	226:5	Upper half	179	183	181
S98T000132		Lower half	192	188	190
S98T000159	226:6	Upper half	161	155	158
S98T000160		Lower half	325	156	241[QC:e]
S98T000161	226:7	Upper half	148	164	156
S98T000162		Lower half	143	157	150

Table B2-30. Tank 241-AX-101 Analytical Results: Iron (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T001005	226:8	Whole	613	402	508[QC:e]
S98T000229	226:9	Upper half	156	151	154
S98T000244		Lower half	182	191	187
S98T000273	226:10	Upper half	176	177	177
S98T000277		Lower half	159	182	171
S98T000274	226:11R	Upper half	<27.5	<27.3	<27.4
S98T000278		Lower half	<28	<27.4	<27.7
S98T000275	226:12	Upper half	<18.3	<20.3	<19.3
S98T000279		Lower half	<28.5	<28.4	<28.4
S98T000280	226:13	Whole	56.6	40.7	48.7[QC:e]
S98T000276	226:14	Upper half	364	338	351
S98T000281		Lower half	76.2	235	156[QC:e]
S98T000510	226:15	Lower half	37.2	36.8	37
S98T000544	228:2	Upper half	254	254	254
S98T000545		Lower half	176	164	170
S98T000542	228:3	Upper half	172	182	177
S98T000543		Lower half	200	202	201
S98T000540	228:4	Upper half	167	200	184
S98T000541		Lower half	220	253	237
S98T000576	228:5	Upper half	161	170	166
S98T000593		Lower half	145	160	153
S98T000607	228:6	Upper half	164	176	170
S98T000630		Lower half	140	140	140
S98T000631	228:7	Lower half	136	154	145
S98T000632	228:8	Upper half	216	218	217
S98T000633		Lower half	231	206	219
S98T000594	228:9	Upper half	315	322	319
S98T000595		Lower half	227	221	224
S98T000634	228:10	Lower half	140	34	87[QC:e]
S98T000774	228:11	Lower half	128	<28.5	<78.3[QC:e]

Table B2-30. Tank 241-AX-101 Analytical Results: Iron (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000795	228:12	Lower half	<29.6	<28.9	<29.3
S98T000796	228:13	Lower half	<29.9	<29.6	<29.8
S98T000797	228:14	Lower half	49.2	56.5	52.9
S98T000798	228:15	Lower half	<28	<27.5	<27.8
S98T000675	Core 226	Solid composite	908	1,190	1,050[QC:e]
S98T000998	Core 228	Solid composite	134	144	139
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<20.1	<20.1	<20.1
S98T001009	226:8	Drainable liquid	<30.1	<30.1	<30.1
S98T000295	226:11R	Drainable liquid	<30.1	<30.1	<30.1
S98T000303	226:12	Drainable liquid	<30.1	<30.1	<30.1
S98T000304	226:13	Drainable liquid	<30.1	<30.1	<30.1
S98T000305	226:14	Drainable liquid	<30.1	<30.1	<30.1
S98T000514	226:15	Drainable liquid	<30.1	<30.1	<30.1
S98T000652	228:7	Drainable liquid	<30.1	<30.1	<30.1
S98T000658	228:10	Drainable liquid	<20.1	<20.1	<20.1
S98T000781	228:11	Drainable liquid	<20.1	<20.1	<20.1
S98T000812	228:12	Drainable liquid	<20.1	<20.1	<20.1
S98T000813	228:13	Drainable liquid	<30.1	<30.1	<30.1
S98T000814	228:14	Drainable liquid	<30.1	<30.1	<30.1
S98T000815	228:15	Drainable liquid	<30.1	<30.1	<30.1
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	<21	<20.9	<20.9
S98T000732		Lower half	<30.8	<30.4	<30.6
S98T000733	226:11R	Upper half	<18.5	<18.5	<18.5
S98T000734		Lower half	<20.4	<19.9	<20.1
S98T000735	226:14	Lower half	<30.1	<29.4	<29.8
S98T000736	228:5	Upper half	<27.7	<26	<26.9
S98T000737		Lower half	<27.1	<30.4	<28.8
S98T000777	228:11	Lower half	<27.7	<29	<28.4

Table B2-30. Tank 241-AX-101 Analytical Results: Iron (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest (Cont'd)			µg/g	µg/g	µg/g
S98T000803	228:14	Lower half	<31.5	<30.9	<31.2
S98T000729	Core 226	Solid composite	<28.8	<28.5	<28.6
S98T001000	Core 228	Solid composite	<30.2	<30.2	<30.2

Table B2-31. Tank 241-AX-101 Analytical Results: Lanthanum (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			µg/g	µg/g	µg/g
S98T000088	226:1	Lower half	<29.8	<30	<29.9
S98T000095	226:2	Upper half	<19.9	<19.8	<19.9
S98T000099		Lower half	<30	<29.8	<29.9
S98T000127	226:3	Upper half	<19.4	<19.8	<19.6
S98T000128		Lower half	<29.9	<29.9	<29.9
S98T000129	226:4	Upper half	<20.4	<20.6	<20.5
S98T000130		Lower half	<29.7	<29.8	<29.8
S98T000131	226:5	Upper half	<29	<29.4	<29.2
S98T000132		Lower half	<30	<29.9	<29.9
S98T000159	226:6	Upper half	<29.5	<29.3	<29.4
S98T000160		Lower half	<29.8	<29.8	<29.8
S98T000161	226:7	Upper half	<29.3	<29.5	<29.4
S98T000162		Lower half	<29.1	<29.4	<29.3
S98T001005	226:8	Whole	<29.8	<20.9	<25.4
S98T000229	226:9	Upper half	<28.7	<28.2	<28.4
S98T000244		Lower half	<29.4	<29.2	<29.3
S98T000273	226:10	Upper half	<29.4	<30.3	<29.9
S98T000277		Lower half	<30.4	<30.4	<30.4
S98T000274	226:11R	Upper half	<27.5	<27.3	<27.4
S98T000278		Lower half	<28	<27.4	<27.7

Table B2-31. Tank 241-AX-101 Analytical Results: Lanthanum (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			µg/g	µg/g	µg/g
S98T000275	226:12	Upper half	<18.3	<20.3	<19.3
S98T000279		Lower half	<28.5	<28.4	<28.4
S98T000280	226:13	Whole	<28.1	<28.8	<28.5
S98T000276	226:14	Upper half	<19.6	<19.7	<19.6
S98T000281		Lower half	<30.4	<30.5	<30.4
S98T000510	226:15	Lower half	<29.3	<21.9	<25.6[QC:e]
S98T000544	228:2	Upper half	<29.8	<29.1	<29.5
S98T000545		Lower half	<28.6	<27.2	<27.9
S98T000542	228:3	Upper half	<28.3	<27.6	<28
S98T000543		Lower half	<27.6	<27	<27.3
S98T000540	228:4	Upper half	<28.2	<28.5	<28.4
S98T000541		Lower half	<28.8	<28.5	<28.6
S98T000576	228:5	Upper half	<29.4	<28.8	<29.1
S98T000593		Lower half	<28.5	<28	<28.3
S98T000607	228:6	Upper half	<25.8	<26.9	<26.4
S98T000630		Lower half	<28.5	<28.3	<28.4
S98T000631	228:7	Lower half	<28.3	<27.6	<28
S98T000632	228:8	Upper half	<27.5	<28.2	<27.9
S98T000633		Lower half	<29.2	<28.4	<28.8
S98T000594	228:9	Upper half	<29.3	<28.7	<29
S98T000595		Lower half	<29.4	<29.6	<29.5
S98T000634	228:10	Lower half	<28.9	<29.5	<29.2
S98T000774	228:11	Lower half	<29.6	<28.5	<29.1
S98T000795	228:12	Lower half	<29.6	<28.9	<29.3
S98T000796	228:13	Lower half	<29.9	<29.6	<29.8
S98T000797	228:14	Lower half	<28.1	<28.7	<28.4
S98T000798	228:15	Lower half	<28	<27.5	<27.8
S98T000675	Core 226	Solid composite	<28.5	<27.9	<28.2
S98T000998	Core 228	Solid composite	<27.4	<27.1	<27.3

Table B2-31. Tank 241-AX-101 Analytical Results: Lanthanum (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<20.1	<20.1	<20.1
S98T001009	226:8	Drainable liquid	<30.1	<30.1	<30.1
S98T000295	226:11R	Drainable liquid	<30.1	<30.1	<30.1
S98T000303	226:12	Drainable liquid	<30.1	<30.1	<30.1
S98T000304	226:13	Drainable liquid	<30.1	<30.1	<30.1
S98T000305	226:14	Drainable liquid	<30.1	<30.1	<30.1
S98T000514	226:15	Drainable liquid	<30.1	<30.1	<30.1
S98T000652	228:7	Drainable liquid	<30.1	<30.1	<30.1
S98T000658	228:10	Drainable liquid	<20.1	<20.1	<20.1
S98T000781	228:11	Drainable liquid	<20.1	<20.1	<20.1
S98T000812	228:12	Drainable liquid	<20.1	<20.1	<20.1
S98T000813	228:13	Drainable liquid	<30.1	<30.1	<30.1
S98T000814	228:14	Drainable liquid	<30.1	<30.1	<30.1
S98T000815	228:15	Drainable liquid	<30.1	<30.1	<30.1
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	<21	<20.9	<20.9
S98T000732		Lower half	<30.8	<30.4	<30.6
S98T000733	226:11R	Upper half	<18.5	<18.5	<18.5
S98T000734		Lower half	<20.4	<19.9	<20.1
S98T000735	226:14	Lower half	<30.1	<29.4	<29.8
S98T000736	228:5	Upper half	<27.7	<26	<26.9
S98T000737		Lower half	<27.1	<30.4	<28.8
S98T000777	228:11	Lower half	<27.7	<29	<28.4
S98T000803	228:14	Lower half	<31.5	<30.9	<31.2
S98T000729	Core 226	Solid composite	<28.8	<28.5	<28.6
S98T001000	Core 228	Solid composite	<30.2	<30.2	<30.2

Table B2-32. Tank 241-AX-101 Analytical Results: Lead (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**µg/g**	**µg/g**	**µg/g**
S98T000088	226:1	Lower half	76.5	119	97.8[QC:e]
S98T000095	226:2	Upper half	72.6	79.5	76
S98T000099		Lower half	90.3	91.4	90.8
S98T000127	226:3	Upper half	76.1	78.9	77.5
S98T000128		Lower half	69.4	77.3	73.3
S98T000129	226:4	Upper half	82.9	93.3	88.1
S98T000130		Lower half	89.6	91.9	90.8
S98T000131	226:5	Upper half	82	126	104[QC:e]
S98T000132		Lower half	80.8	83	81.9
S98T000159	226:6	Upper half	84.2	85.4	84.8
S98T000160		Lower half	91	90.1	90.5
S98T000161	226:7	Upper half	75.9	78.9	77.4
S98T000162		Lower half	80.4	91.1	85.8
S98T001005	226:8	Whole	267	175	221[QC:e]
S98T000229	226:9	Upper half	79.9	84.9	82.4
S98T000244		Lower half	103	77.9	90.5[QC:e]
S98T000273	226:10	Upper half	107	113	110
S98T000277		Lower half	92.5	105	98.8
S98T000274	226:11R	Upper half	81	86.7	83.8
S98T000278		Lower half	76.5	78.8	77.7
S98T000275	226:12	Upper half	54.8	62.2	58.5
S98T000279		Lower half	80.6	90.3	85.4
S98T000280	226:13	Whole	67	75.8	71.4
S98T000276	226:14	Upper half	56.1	52.8	54.5
S98T000281		Lower half	<60.7	<61	<60.9
S98T000510	226:15	Lower half	<58.6	78.6	<68.6[QC:e]
S98T000544	228:2	Upper half	114	81.8	97.9[QC:e]
S98T000545		Lower half	76	73.2	74.6
S98T000542	228:3	Upper half	73.5	84.4	79
S98T000543		Lower half	79	116	97.5[QC:e]

Table B2-32. Tank 241-AX-101 Analytical Results: Lead (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000540	228:4	Upper half	84.5	93.6	89
S98T000541		Lower half	80.9	77.1	79
S98T000576	228:5	Upper half	72	73.1	72.5
S98T000593		Lower half	59.7	78.2	69[QC:e]
S98T000607	228:6	Upper half	76.2	75.1	75.7
S98T000630		Lower half	72.8	78.9	75.8
S98T000631	228:7	Lower half	72.7	78.7	75.7
S98T000632	228:8	Upper half	83.5	88.4	86
S98T000633		Lower half	95.5	86.5	91
S98T000594	228:9	Upper half	117	105	111
S98T000595		Lower half	102	132	117[QC:e]
S98T000634	228:10	Lower half	77.5	75.6	76.5
S98T000774	228:11	Lower half	<59.3	62.2	<60.8
S98T000795	228:12	Lower half	<59.2	63.3	<61.3
S98T000796	228:13	Lower half	<59.8	65	<62.4
S98T000797	228:14	Lower half	<56.2	61	<58.6
S98T000798	228:15	Lower half	63.2	<54.9	<59
S98T000675	Core 226	Solid composite	209	224	217
S98T000998	Core 228	Solid composite	74	76.1	75
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<40.1	<40.1	<40.1
S98T001009	226:8	Drainable liquid	<60.1	<60.1	<60.1
S98T000295	226:11R	Drainable liquid	167	159	163
S98T000303	226:12	Drainable liquid	164	160	162
S98T000304	226:13	Drainable liquid	143	141	142
S98T000305	226:14	Drainable liquid	322	132	227[QC:c,e]
S98T000514	226:15	Drainable liquid	148	155	152
S98T000652	228:7	Drainable liquid	118	120	119
S98T000658	228:10	Drainable liquid	130	126	128
S98T000781	228:11	Drainable liquid	131	140	136

Table B2-32. Tank 241-AX-101 Analytical Results: Lead (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids (Cont'd)			**μg/mL**	**μg/mL**	**μg/mL**
S98T000812	228:12	Drainable liquid	149	147	148
S98T000813	228:13	Drainable liquid	143	149	146
S98T000814	228:14	Drainable liquid	172	168	170
S98T000815	228:15	Drainable liquid	190	228	209
Solids: water digest			**μg/g**	**μg/g**	**μg/g**
S98T000731	226:5	Upper half	<41.9	<41.7	<41.8
S98T000732		Lower half	<61.6	<60.8	<61.2
S98T000733	226:11R	Upper half	58.1	60	59
S98T000734		Lower half	72.2	67.8	70
S98T000735	226:14	Lower half	<60.1	<58.8	<59.5
S98T000736	228:5	Upper half	<55.4	<51.9	<53.6
S98T000737		Lower half	<54.1	<60.7	<57.4
S98T000777	228:11	Lower half	<55.4	<58.1	<56.8
S98T000803	228:14	Lower half	<62.9	<61.9	<62.4
S98T000729	Core 226	Solid composite	<57.6	<57	<57.3
S98T001000	Core 228	Solid composite	<60.3	<60.4	<60.3

Table B2-33. Tank 241-AX-101 Analytical Results: Lithium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**μg/g**	**μg/g**	**μg/g**
S98T000088	226:1	Lower half	669	635	652
S98T000095	226:2	Upper half	9.01	8.24	8.63
S98T000099		Lower half	<6.01	<5.97	<5.99
S98T000127	226:3	Upper half	26.6	33.1	29.9[QC:e]
S98T000128		Lower half	7.82	7.76	7.79
S98T000129	226:4	Upper half	32.6	30.9	31.8
S98T000130		Lower half	<5.94	<5.95	<5.95

Table B2-33. Tank 241-AX-101 Analytical Results: Lithium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000131	226:5	Upper half	30.9	33.7	32.3
S98T000132		Lower half	6.31	7.19	6.75
S98T000159	226:6	Upper half	15.2	14.1	14.6
S98T000160		Lower half	10	7.42	8.71^QC:e
S98T000161	226:7	Upper half	34.4	37.4	35.9
S98T000162		Lower half	7.71	9.02	8.37
S98T001005	226:8	Whole	14.1	9.82	12^QC:e
S98T000229	226:9	Upper half	19.9	19.8	19.9
S98T000244		Lower half	17.3	19.3	18.3
S98T000273	226:10	Upper half	67.4	65.4	66.4
S98T000277		Lower half	9.31	11	10.2
S98T000274	226:11R	Upper half	5.6	6.11	5.86
S98T000278		Lower half	<5.61	<5.48	<5.54
S98T000275	226:12	Upper half	6.26	6.84	6.55
S98T000279		Lower half	<5.69	6.34	<6.02
S98T000280	226:13	Whole	111	167	139^QC:e
S98T000276	226:14	Upper half	71.7	80	75.8
S98T000281		Lower half	12.9	13.1	13
S98T000510	226:15	Lower half	15.4	27.8	21.6^QC:e
S98T000544	228:2	Upper half	82.3	82.8	82.5
S98T000545		Lower half	<5.71	<5.43	<5.57
S98T000542	228:3	Upper half	21.1	24.6	22.9
S98T000543		Lower half	<5.51	<5.4	<5.46
S98T000540	228:4	Upper half	133	53.3	93.2^QC:e
S98T000541		Lower half	18.1	19	18.6
S98T000576	228:5	Upper half	8.2	8.48	8.34
S98T000593		Lower half	9.73	14	11.9^QC:e
S98T000607	228:6	Upper half	25.5	26.9	26.2
S98T000630		Lower half	15.7	16	15.8
S98T000631	228:7	Lower half	38.7	39.8	39.3

Table B2-33. Tank 241-AX-101 Analytical Results: Lithium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000632	228:8	Upper half	20.6	21.4	21
S98T000633		Lower half	7.21	6.84	7.03
S98T000594	228:9	Upper half	10.2	12.6	11.4[QC:e]
S98T000595		Lower half	8.35	<5.93	<7.14[QC:e]
S98T000634	228:10	Lower half	18.8	17.9	18.4
S98T000774	228:11	Lower half	153	157	155
S98T000795	228:12	Lower half	10.9	12.5	11.7
S98T000796	228:13	Lower half	20.1	25.7	22.9[QC:e]
S98T000797	228:14	Lower half	129	134	132
S98T000798	228:15	Lower half	18.8	17.1	18
S98T000675	Core 226	Solid composite	65.5	71.7	68.6
S98T000998	Core 228	Solid composite	28.8	39.3	34[QC:e]
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	34.4	35.4	34.9
S98T001009	226:8	Drainable liquid	<6.01	<6.01	<6.01
S98T000295	226:11R	Drainable liquid	<6.01	<6.01	<6.01
S98T000303	226:12	Drainable liquid	6.83	7.28	7.05
S98T000304	226:13	Drainable liquid	6.95	7.32	7.13
S98T000305	226:14	Drainable liquid	<6.01	<6.01	<6.01
S98T000514	226:15	Drainable liquid	<6.01	<6.01	<6.01
S98T000652	228:7	Drainable liquid	<6.01	<6.01	<6.01
S98T000658	228:10	Drainable liquid	<4.01	<4.01	<4.01
S98T000781	228:11	Drainable liquid	9	9.6	9.3
S98T000812	228:12	Drainable liquid	15.7	15.2	15.4
S98T000813	228:13	Drainable liquid	8.71	8.85	8.78
S98T000814	228:14	Drainable liquid	6.12	6.68	6.4
S98T000815	228:15	Drainable liquid	9.88	12	10.9

Table B2-33. Tank 241-AX-101 Analytical Results: Lithium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	<4.19	<4.17	<4.18
S98T000732		Lower half	<6.16	<6.08	<6.12
S98T000733	226:11R	Upper half	<3.7	<3.71	<3.71
S98T000734		Lower half	<4.08	<3.98	<4.03
S98T000735	226:14	Lower half	<6.01	<5.88	<5.95
S98T000736	228:5	Upper half	<5.54	<5.19	<5.37
S98T000737		Lower half	<5.41	<6.07	<5.74
S98T000777	228:11	Lower half	17.3	16.8	17.1
S98T000803	228:14	Lower half	15.9	14	14.9
S98T000729	Core 226	Solid composite	<5.76	<5.7	<5.73
S98T001000	Core 228	Solid composite	<6.03	<6.04	<6.04

Table B2-34. Tank 241-AX-101 Analytical Results: Magnesium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**µg/g**	**µg/g**	**µg/g**
S98T000088	226:1	Lower half	<59.7	<60	<59.9
S98T000095	226:2	Upper half	<39.8	<39.7	<39.8
S98T000099		Lower half	<60.1	<59.7	<59.9
S98T000127	226:3	Upper half	<38.8	<39.5	<39.1
S98T000128		Lower half	<59.9	<59.9	<59.9
S98T000129	226:4	Upper half	<40.8	<41.2	<41
S98T000130		Lower half	<59.4	<59.5	<59.5
S98T000131	226:5	Upper half	<58	<58.7	<58.4
S98T000132		Lower half	<59.9	<59.8	<59.8
S98T000159	226:6	Upper half	<59	<58.7	<58.9
S98T000160		Lower half	<59.5	<59.6	<59.5
S98T000161	226:7	Upper half	<58.6	<59	<58.8
S98T000162		Lower half	62.6	74.1	68.3

Table B2-34. Tank 241-AX-101 Analytical Results: Magnesium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T001005	226:8	Whole	<59.5	<41.9	<50.7
S98T000229	226:9	Upper half	<57.4	<56.5	<57
S98T000244		Lower half	65.9	73.3	69.6
S98T000273	226:10	Upper half	<58.8	<60.7	<59.8
S98T000277		Lower half	<60.7	71.7	<66.2
S98T000274	226:11R	Upper half	<55.1	<54.6	<54.9
S98T000278		Lower half	<56.1	<54.8	<55.5
S98T000275	226:12	Upper half	<36.7	<40.6	<38.7
S98T000279		Lower half	<56.9	<56.9	<56.9
S98T000280	226:13	Whole	<56.1	<57.7	<56.9
S98T000276	226:14	Upper half	<39.1	<39.4	<39.3
S98T000281		Lower half	<60.7	<61	<60.9
S98T000510	226:15	Lower half	<58.6	<43.8	<51.2
S98T000544	228:2	Upper half	<59.7	<58.2	<59
S98T000545		Lower half	<57.1	<54.3	<55.7
S98T000542	228:3	Upper half	<56.7	<55.2	<56
S98T000543		Lower half	<55.1	<54	<54.5
S98T000540	228:4	Upper half	<56.3	<57	<56.6
S98T000541		Lower half	<57.7	<57	<57.4
S98T000576	228:5	Upper half	<58.9	<57.5	<58.2
S98T000593		Lower half	<57	<56	<56.5
S98T000607	228:6	Upper half	<51.6	<53.7	<52.7
S98T000630		Lower half	<57.1	<56.5	<56.8
S98T000631	228:7	Lower half	<56.5	<55.1	<55.8
S98T000632	228:8	Upper half	<55	<56.3	<55.6
S98T000633		Lower half	<58.4	<56.8	<57.6
S98T000594	228:9	Upper half	<58.5	<57.5	<58
S98T000595		Lower half	<58.8	<59.3	<59
S98T000634	228:10	Lower half	<57.8	<59	<58.4
S98T000774	228:11	Lower half	<59.3	<56.9	<58.1

Table B2-34. Tank 241-AX-101 Analytical Results: Magnesium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**μg/g**	**μg/g**	**μg/g**
S98T000795	228:12	Lower half	<59.2	<57.7	<58.5
S98T000796	228:13	Lower half	<59.8	<59.3	<59.5
S98T000797	228:14	Lower half	<56.2	<57.4	<56.8
S98T000798	228:15	Lower half	<56.1	<54.9	<55.5
S98T000675	Core 226	Solid composite	<56.9	<55.8	<56.3
S98T000998	Core 228	Solid composite	<54.8	<54.2	<54.5
Liquids			**μg/mL**	**μg/mL**	**μg/mL**
S98T000090	226:1	Drainable liquid	<40.1	<40.1	<40.1
S98T001009	226:8	Drainable liquid	<60.1	<60.1	<60.1
S98T000295	226:11R	Drainable liquid	<60.1	<60.1	<60.1
S98T000303	226:12	Drainable liquid	<60.1	<60.1	<60.1
S98T000304	226:13	Drainable liquid	<60.1	<60.1	<60.1
S98T000305	226:14	Drainable liquid	<60.1	<60.1	<60.1
S98T000514	226:15	Drainable liquid	<60.1	<60.1	<60.1
S98T000652	228:7	Drainable liquid	<60.1	<60.1	<60.1
S98T000658	228:10	Drainable liquid	<40.1	<40.1	<40.1
S98T000781	228:11	Drainable liquid	<40.1	<40.1	<40.1
S98T000812	228:12	Drainable liquid	<40.1	<40.1	<40.1
S98T000813	228:13	Drainable liquid	<60.1	<60.1	<60.1
S98T000814	228:14	Drainable liquid	<60.1	<60.1	<60.1
S98T000815	228:15	Drainable liquid	<60.1	<60.1	<60.1
Solids: water digest			**μg/g**	**μg/g**	**μg/g**
S98T000731	226:5	Upper half	<41.9	<41.7	<41.8
S98T000732		Lower half	<61.6	<60.8	<61.2
S98T000733	226:11R	Upper half	<37	<37.1	<37
S98T000734		Lower half	<40.8	<39.8	<40.3
S98T000735	226:14	Lower half	<60.1	<58.8	<59.5
S98T000736	228:5	Upper half	<55.4	<51.9	<53.6
S98T000737		Lower half	<54.1	<60.7	<57.4
S98T000777	228:11	Lower half	<55.4	<58.1	<56.8

Table B2-34. Tank 241-AX-101 Analytical Results: Magnesium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest (Cont'd)			μg/g	μg/g	μg/g
S98T000803	228:14	Lower half	<62.9	<61.9	<62.4
S98T000729	Core 226	Solid composite	<57.6	<57	<57.3
S98T001000	Core 228	Solid composite	<60.3	<60.4	<60.3

Table B2-35. Tank 241-AX-101 Analytical Results: Manganese (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			μg/g	μg/g	μg/g
S98T000088	226:1	Lower half	80.7	194	137[QC:e]
S98T000095	226:2	Upper half	18.7	19.2	18.9
S98T000099		Lower half	24.6	25.3	25
S98T000127	226:3	Upper half	19	24.2	21.6[QC:e]
S98T000128		Lower half	17.7	17.5	17.6
S98T000129	226:4	Upper half	27.1	26.1	26.6
S98T000130		Lower half	27.7	30.1	28.9
S98T000131	226:5	Upper half	27.2	27.8	27.5
S98T000132		Lower half	30	29.9	29.9
S98T000159	226:6	Upper half	23.5	23	23.3
S98T000160		Lower half	24.2	23.4	23.8
S98T000161	226:7	Upper half	20.3	21.7	21
S98T000162		Lower half	18.6	19.7	19.1
S98T001005	226:8	Whole	89.5	58.4	74[QC:e]
S98T000229	226:9	Upper half	21	20.8	20.9
S98T000244		Lower half	23.6	25.9	24.8
S98T000273	226:10	Upper half	22.9	24.2	23.5
S98T000277		Lower half	20.6	23.2	21.9
S98T000274	226:11R	Upper half	<5.51	<5.46	<5.48
S98T000278		Lower half	<5.61	<5.48	<5.54

Table B2-35. Tank 241-AX-101 Analytical Results: Manganese (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000275	226:12	Upper half	<3.67	<4.06	<3.86
S98T000279		Lower half	<5.69	<5.69	<5.69
S98T000280	226:13	Whole	<5.61	<5.77	<5.69
S98T000276	226:14	Upper half	4.6	4.62	4.61
S98T000281		Lower half	<6.07	<6.1	<6.08
S98T000510	226:15	Lower half	<5.86	<4.38	<5.12
S98T000544	228:2	Upper half	36.6	36.3	36.5
S98T000545		Lower half	28.3	24.6	26.5
S98T000542	228:3	Upper half	27.5	29.7	28.6
S98T000543		Lower half	31.8	33.1	32.5
S98T000540	228:4	Upper half	27.3	30.9	29.1
S98T000541		Lower half	34.3	36	35.1
S98T000576	228:5	Upper half	24	25.3	24.6
S98T000593		Lower half	22.6	25.5	24.1
S98T000607	228:6	Upper half	24.1	25.8	25
S98T000630		Lower half	22.5	22.7	22.6
S98T000631	228:7	Lower half	20	20.9	20.4
S98T000632	228:8	Upper half	30.2	30.5	30.4
S98T000633		Lower half	33.1	30.3	31.7
S98T000594	228:9	Upper half	48.4	46	47.2
S98T000595		Lower half	27.2	27.9	27.5
S98T000634	228:10	Lower half	<5.78	<5.9	<5.84
S98T000774	228:11	Lower half	<5.93	<5.69	<5.81
S98T000795	228:12	Lower half	<5.92	<5.77	<5.84
S98T000796	228:13	Lower half	<5.98	<5.93	<5.96
S98T000797	228:14	Lower half	<5.62	<5.74	<5.68
S98T000798	228:15	Lower half	<5.61	<5.49	<5.55
S98T000675	Core 226	Solid composite	28.3	29.6	29
S98T000998	Core 228	Solid composite	19	21.3	20.1

Table B2-35. Tank 241-AX-101 Analytical Results: Manganese (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<4.01	<4.01	<4.01
S98T001009	226:8	Drainable liquid	<6.01	<6.01	<6.01
S98T000295	226:11R	Drainable liquid	<6.01	<6.01	<6.01
S98T000303	226:12	Drainable liquid	<6.01	<6.01	<6.01
S98T000304	226:13	Drainable liquid	<6.01	<6.01	<6.01
S98T000305	226:14	Drainable liquid	<6.01	<6.01	<6.01
S98T000514	226:15	Drainable liquid	<6.01	<6.01	<6.01
S98T000652	228:7	Drainable liquid	<6.01	<6.01	<6.01
S98T000658	228:10	Drainable liquid	<4.01	<4.01	<4.01
S98T000781	228:11	Drainable liquid	<4.01	<4.01	<4.01
S98T000812	228:12	Drainable liquid	<4.01	<4.01	<4.01
S98T000813	228:13	Drainable liquid	<6.01	<6.01	<6.01
S98T000814	228:14	Drainable liquid	<6.01	<6.01	<6.01
S98T000815	228:15	Drainable liquid	<6.01	<6.01	<6.01
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	<4.19	<4.17	<4.18
S98T000732		Lower half	<6.16	<6.08	<6.12
S98T000733	226:11R	Upper half	<3.7	<3.71	<3.71
S98T000734		Lower half	<4.08	<3.98	<4.03
S98T000735	226:14	Lower half	<6.01	<5.88	<5.95
S98T000736	228:5	Upper half	<5.54	<5.19	<5.37
S98T000737		Lower half	<5.41	<6.07	<5.74
S98T000777	228:11	Lower half	<5.54	<5.81	<5.67
S98T000803	228:14	Lower half	<6.29	<6.19	<6.24
S98T000729	Core 226	Solid composite	<5.76	<5.7	<5.73
S98T001000	Core 228	Solid composite	<6.03	<6.04	<6.04

Table B2-36. Tank 241-AX-101 Analytical Results: Molybdenum (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			μg/g	μg/g	μg/g
S98T000088	226:1	Lower half	<29.8	<30	<29.9
S98T000095	226:2	Upper half	58.5	59.4	59
S98T000099		Lower half	67.1	65.5	66.3
S98T000127	226:3	Upper half	59.8	57.5	58.6
S98T000128		Lower half	58	57	57.5
S98T000129	226:4	Upper half	61.7	57.3	59.5
S98T000130		Lower half	64.5	62.5	63.5
S98T000131	226:5	Upper half	60.5	60.4	60.5
S98T000132		Lower half	57.6	58.3	58
S98T000159	226:6	Upper half	60.6	59.4	60
S98T000160		Lower half	63.7	63.2	63.5
S98T000161	226:7	Upper half	59.7	61.2	60.5
S98T000162		Lower half	59.5	63.7	61.6
S98T001005	226:8	Whole	32.9	21.5	27.2[QC:e]
S98T000229	226:9	Upper half	64.9	63.3	64.1
S98T000244		Lower half	59.8	62.9	61.3
S98T000273	226:10	Upper half	64.6	65.3	64.9
S98T000277		Lower half	68.5	65.4	67
S98T000274	226:11R	Upper half	68.2	70	69.1
S98T000278		Lower half	70.3	77.2	73.8
S98T000275	226:12	Upper half	62.7	63.8	63.3
S98T000279		Lower half	70.3	88	79.2[QC:e]
S98T000280	226:13	Whole	67.7	73.1	70.4
S98T000276	226:14	Upper half	46	51.4	48.7
S98T000281		Lower half	40.5	36.4	38.5
S98T000510	226:15	Lower half	42.8	73.5	58.1[QC:e]
S98T000544	228:2	Upper half	54.3	59	56.6
S98T000545		Lower half	55.6	55.8	55.7
S98T000542	228:3	Upper half	57.9	62.5	60.2
S98T000543		Lower half	54.4	60.6	57.5

Table B2-36. Tank 241-AX-101 Analytical Results: Molybdenum (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000540	228:4	Upper half	64.3	65.3	64.8
S98T000541		Lower half	56.9	52.3	54.6
S98T000576	228:5	Upper half	60	56.2	58.1
S98T000593		Lower half	48.5	59.7	54.1[QC:c]
S98T000607	228:6	Upper half	56	59.4	57.7
S98T000630		Lower half	54.7	54.9	54.8
S98T000631	228:7	Lower half	58.8	63.3	61
S98T000632	228:8	Upper half	52.6	58.8	55.7
S98T000633		Lower half	62.2	58.7	60.5
S98T000594	228:9	Upper half	61.2	64.8	63
S98T000595		Lower half	66.8	65.4	66.1
S98T000634	228:10	Lower half	70.1	66.6	68.3
S98T000774	228:11	Lower half	55	55.5	55.3
S98T000795	228:12	Lower half	57.3	65.6	61.4
S98T000796	228:13	Lower half	53.6	61.8	57.7
S98T000797	228:14	Lower half	46.8	47.6	47.2
S98T000798	228:15	Lower half	57.5	51.9	54.7
S98T000675	Core 226	Solid composite	34.4	35.5	35
S98T000998	Core 228	Solid composite	61.1	65.6	63.3
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	31.5	31.2	31.4
S98T001009	226:8	Drainable liquid	53.4	54.8	54.1
S98T000295	226:11R	Drainable liquid	168	161	165
S98T000303	226:12	Drainable liquid	163	161	162
S98T000304	226:13	Drainable liquid	135	134	135
S98T000305	226:14	Drainable liquid	145	139	142
S98T000514	226:15	Drainable liquid	154	157	156
S98T000652	228:7	Drainable liquid	137	142	140
S98T000658	228:10	Drainable liquid	132	137	135
S98T000781	228:11	Drainable liquid	134	135	135

Table B2-36. Tank 241-AX-101 Analytical Results: Molybdenum (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids (Cont'd)			**µg/mL**	**µg/mL**	**µg/mL**
S98T000812	228:12	Drainable liquid	144	141	143
S98T000813	228:13	Drainable liquid	137	146	142
S98T000814	228:14	Drainable liquid	154	163	159
S98T000815	228:15	Drainable liquid	173	215	194[QC:e]
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	63.2	63.6	63.4
S98T000732		Lower half	59.8	62.4	61.1
S98T000733	226:11R	Upper half	68.5	71.4	70
S98T000734		Lower half	76.2	72.9	74.6
S98T000735	226:14	Lower half	35.7	33.5	34.6
S98T000736	228:5	Upper half	61.1	60.1	60.6
S98T000737		Lower half	62.1	57.6	59.9
S98T000777	228:11	Lower half	54.6	53.3	54
S98T000803	228:14	Lower half	48.6	54.5	51.5
S98T000729	Core 226	Solid composite	38.5	34.8	36.6
S98T001000	Core 228	Solid composite	61.5	62.6	62

Table B2-37. Tank 241-AX-101 Analytical Results: Neodymium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**µg/g**	**µg/g**	**µg/g**
S98T000088	226:1	Lower half	<59.7	<60	<59.9
S98T000095	226:2	Upper half	<39.8	<39.7	<39.8
S98T000099		Lower half	<60.1	<59.7	<59.9
S98T000127	226:3	Upper half	<38.8	<39.5	<39.1
S98T000128		Lower half	<59.9	<59.9	<59.9
S98T000129	226:4	Upper half	<40.8	<41.2	<41
S98T000130		Lower half	<59.4	<59.5	<59.5

Table B2-37. Tank 241-AX-101 Analytical Results: Neodymium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000131	226:5	Upper half	<58	<58.7	<58.4
S98T000132		Lower half	<59.9	<59.8	<59.8
S98T000159	226:6	Upper half	<59	<58.7	<58.9
S98T000160		Lower half	<59.5	<59.6	<59.5
S98T000161	226:7	Upper half	<58.6	<59	<58.8
S98T000162		Lower half	<58.1	<58.9	<58.5
S98T001005	226:8	Whole	<59.5	<41.9	<50.7
S98T000229	226:9	Upper half	<57.4	<56.5	<57
S98T000244		Lower half	<58.9	<58.4	<58.6
S98T000273	226:10	Upper half	<58.8	<60.7	<59.8
S98T000277		Lower half	<60.7	<60.8	<60.8
S98T000274	226:11R	Upper half	<55.1	<54.6	<54.9
S98T000278		Lower half	<56.1	<54.8	<55.5
S98T000275	226:12	Upper half	<36.7	<40.6	<38.7
S98T000279		Lower half	<56.9	<56.9	<56.9
S98T000280	226:13	Whole	<56.1	<57.7	<56.9
S98T000276	226:14	Upper half	<39.1	<39.4	<39.3
S98T000281		Lower half	<60.7	<61	<60.9
S98T000510	226:15	Lower half	<58.6	<43.8	<51.2
S98T000544	228:2	Upper half	<59.7	<58.2	<59
S98T000545		Lower half	<57.1	<54.3	<55.7
S98T000542	228:3	Upper half	<56.7	<55.2	<56
S98T000543		Lower half	<55.1	<54	<54.5
S98T000540	228:4	Upper half	<56.3	<57	<56.6
S98T000541		Lower half	<57.7	<57	<57.4
S98T000576	228:5	Upper half	<58.9	<57.5	<58.2
S98T000593		Lower half	<57	<56	<56.5
S98T000607	228:6	Upper half	<51.6	<53.7	<52.7
S98T000630		Lower half	<57.1	<56.5	<56.8
S98T000631	228:7	Lower half	<56.5	<55.1	<55.8

Table B2-37. Tank 241-AX-101 Analytical Results: Neodymium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000632	228:8	Upper half	<55	<56.3	<55.6
S98T000633		Lower half	<58.4	<56.8	<57.6
S98T000594	228:9	Upper half	<58.5	<57.5	<58
S98T000595		Lower half	<58.8	<59.3	<59
S98T000634	228:10	Lower half	<57.8	<59	<58.4
S98T000774	228:11	Lower half	<59.3	<56.9	<58.1
S98T000795	228:12	Lower half	<59.2	<57.7	<58.5
S98T000796	228:13	Lower half	<59.8	<59.3	<59.5
S98T000797	228:14	Lower half	<56.2	<57.4	<56.8
S98T000798	228:15	Lower half	<56.1	<54.9	<55.5
S98T000675	Core 226	Solid composite	<56.9	<55.8	<56.3
S98T000998	Core 228	Solid composite	<54.8	<54.2	<54.5
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<40.1	<40.1	<40.1
S98T001009	226:8	Drainable liquid	<60.1	<60.1	<60.1
S98T000295	226:11R	Drainable liquid	<60.1	<60.1	<60.1
S98T000303	226:12	Drainable liquid	<60.1	<60.1	<60.1
S98T000304	226:13	Drainable liquid	<60.1	<60.1	<60.1
S98T000305	226:14	Drainable liquid	<60.1	<60.1	<60.1
S98T000514	226:15	Drainable liquid	<60.1	<60.1	<60.1
S98T000652	228:7	Drainable liquid	<60.1	<60.1	<60.1
S98T000658	228:10	Drainable liquid	<40.1	<40.1	<40.1
S98T000781	228:11	Drainable liquid	<40.1	<40.1	<40.1
S98T000812	228:12	Drainable liquid	<40.1	<40.1	<40.1
S98T000813	228:13	Drainable liquid	<60.1	<60.1	<60.1
S98T000814	228:14	Drainable liquid	<60.1	<60.1	<60.1
S98T000815	228:15	Drainable liquid	<60.1	<60.1	<60.1

Table B2-37. Tank 241-AX-101 Analytical Results: Neodymium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			**μg/g**	**μg/g**	**μg/g**
S98T000731	226:5	Upper half	<41.9	<41.7	<41.8
S98T000732		Lower half	<61.6	<60.8	<61.2
S98T000733	226:11R	Upper half	<37	<37.1	<37
S98T000734		Lower half	<40.8	<39.8	<40.3
S98T000735	226:14	Lower half	<60.1	<58.8	<59.5
S98T000736	228:5	Upper half	<55.4	<51.9	<53.6
S98T000737		Lower half	<54.1	<60.7	<57.4
S98T000777	228:11	Lower half	<55.4	<58.1	<56.8
S98T000803	228:14	Lower half	<62.9	<61.9	<62.4
S98T000729	Core 226	Solid composite	<57.6	<57	<57.3
S98T001000	Core 228	Solid composite	<60.3	<60.4	<60.3

Table B2-38. Tank 241-AX-101 Analytical Results: Nickel (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**μg/g**	**μg/g**	**μg/g**
S98T000088	226:1	Lower half	20.3	28.8	24.6[QC:e]
S98T000095	226:2	Upper half	31.4	30.9	31.1
S98T000099		Lower half	40	39.3	39.6
S98T000127	226:3	Upper half	40.7	53.2	47[QC:e]
S98T000128		Lower half	38.3	37	37.6
S98T000129	226:4	Upper half	61.4	57.3	59.3
S98T000130		Lower half	61	67.2	64.1
S98T000131	226:5	Upper half	64.9	67.2	66.1
S98T000132		Lower half	79.4	76.6	78
S98T000159	226:6	Upper half	75.5	74.4	75
S98T000160		Lower half	68.8	73.9	71.3
S98T000161	226:7	Upper half	69.7	73.1	71.4
S98T000162		Lower half	70.8	79.6	75.2

Table B2-38. Tank 241-AX-101 Analytical Results: Nickel (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T001005	226:8	Whole	357	233	295[QC:c]
S98T000229	226:9	Upper half	78.4	81.1	79.8
S98T000244		Lower half	79.8	85.6	82.7
S98T000273	226:10	Upper half	101	105	103
S98T000277		Lower half	112	140	126[QC:c]
S98T000274	226:11R	Upper half	<11	<10.9	<10.9
S98T000278		Lower half	<11.2	<11	<11.1
S98T000275	226:12	Upper half	<7.34	<8.12	<7.73
S98T000279		Lower half	<11.4	<11.4	<11.4
S98T000280	226:13	Whole	<11.2	<11.5	<11.3
S98T000276	226:14	Upper half	36.8	41.4	39.1
S98T000281		Lower half	46	45.3	45.6
S98T000510	226:15	Lower half	37.5	39.1	38.3
S98T000544	228:2	Upper half	50.1	52.1	51.1
S98T000545		Lower half	53.7	47.8	50.8
S98T000542	228:3	Upper half	63.1	68.2	65.7
S98T000543		Lower half	64.8	72.1	68.4
S98T000540	228:4	Upper half	73.5	80.3	76.9
S98T000541		Lower half	71.3	70.5	70.9
S98T000576	228:5	Upper half	66.1	70.4	68.3
S98T000593		Lower half	60.5	72.1	66.3
S98T000607	228:6	Upper half	67.6	70.9	69.3
S98T000630		Lower half	66.8	63.2	65
S98T000631	228:7	Lower half	61.1	59.6	60.4
S98T000632	228:8	Upper half	92.1	92.5	92.3
S98T000633		Lower half	134	112	123
S98T000594	228:9	Upper half	162	145	154
S98T000595		Lower half	183	191	187
S98T000634	228:10	Lower half	62.3	56.9	59.6
S98T000774	228:11	Lower half	<11.9	<11.4	<11.7

Table B2-38. Tank 241-AX-101 Analytical Results: Nickel (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000795	228:12	Lower half	<11.8	<11.5	<11.7
S98T000796	228:13	Lower half	<12	<11.9	<11.9
S98T000797	228:14	Lower half	<11.2	<11.5	<11.3
S98T000798	228:15	Lower half	16.6	11	13.8[QC:e]
S98T000675	Core 226	Solid composite	76.1	77.8	76.9
S98T000998	Core 228	Solid composite	56.6	65.9	61.3
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<8.02	<8.02	<8.02
S98T001009	226:8	Drainable liquid	<12	<12	<12
S98T000295	226:11R	Drainable liquid	<12	<12	<12
S98T000303	226:12	Drainable liquid	<12	<12	<12
S98T000304	226:13	Drainable liquid	<12	<12	<12
S98T000305	226:14	Drainable liquid	<12	<12	<12
S98T000514	226:15	Drainable liquid	<12	<12	<12
S98T000652	228:7	Drainable liquid	<12	<12	<12
S98T000658	228:10	Drainable liquid	8.23	<8.02	<8.13
S98T000781	228:11	Drainable liquid	<8.02	<8.02	<8.02
S98T000812	228:12	Drainable liquid	<8.02	<8.02	<8.02
S98T000813	228:13	Drainable liquid	<12	<12	<12
S98T000814	228:14	Drainable liquid	<12	<12	<12
S98T000815	228:15	Drainable liquid	<12	<12	<12
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	<8.39	<8.35	<8.37
S98T000732		Lower half	<12.3	<12.2	<12.3
S98T000733	226:11R	Upper half	<7.4	<7.41	<7.41
S98T000734		Lower half	<8.16	<7.96	<8.06
S98T000735	226:14	Lower half	<12	<11.8	<11.9
S98T000736	228:5	Upper half	<11.1	<10.4	<10.8
S98T000737		Lower half	<10.8	<12.1	<11.4
S98T000777	228:11	Lower half	<11.1	<11.6	<11.3

Table B2-38. Tank 241-AX-101 Analytical Results: Nickel (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest (Cont'd)			μg/g	μg/g	μg/g
S98T000803	228:14	Lower half	<12.6	<12.4	<12.5
S98T000729	Core 226	Solid composite	<11.5	<11.4	<11.4
S98T001000	Core 228	Solid composite	<12.1	<12.1	<12.1

Table B2-39. Tank 241-AX-101 Analytical Results: Phosphorus (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			μg/g	μg/g	μg/g
S98T000088	226:1	Lower half	2,020	1,720	1,870[QC:d]
S98T000095	226:2	Upper half	1,430	1,330	1,380
S98T000099		Lower half	1,750	1,460	1,610
S98T000127	226:3	Upper half	1,280	1,460	1,370
S98T000128		Lower half	1,480	931	1,210[QC:e]
S98T000129	226:4	Upper half	990	952	971
S98T000130		Lower half	1,170	1,220	1,200
S98T000131	226:5	Upper half	2,760	2,000	2,380[QC:e]
S98T000132		Lower half	1,630	1,430	1,530[QC:c]
S98T000159	226:6	Upper half	1,290	1,060	1,180
S98T000160		Lower half	1,230	1,280	1,260
S98T000161	226:7	Upper half	1,220	1,300	1,260
S98T000162		Lower half	1,350	1,400	1,380
S98T001005	226:8	Whole	865	563	714[QC:e]
S98T000229	226:9	Upper half	1,280	1,340	1,310
S98T000244		Lower half	1,190	1,260	1,230
S98T000273	226:10	Upper half	1,320	1,380	1,350
S98T000277		Lower half	1,340	1,390	1,370
S98T000274	226:11R	Upper half	2,330	2,460	2,400
S98T000278		Lower half	1,580	1,680	1,630

Table B2-39. Tank 241-AX-101 Analytical Results: Phosphorus (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000275	226:12	Upper half	2,880	2,960	2,920
S98T000279		Lower half	1,850	1,590	1,720
S98T000280	226:13	Whole	2,600	2,810	2,710
S98T000276	226:14	Upper half	2,190	2,440	2,320
S98T000281		Lower half	614	593	604
S98T000510	226:15	Lower half	1,080	1,350	1,220[QC:e]
S98T000544	228:2	Upper half	862	874	868
S98T000545		Lower half	709	840	775
S98T000542	228:3	Upper half	996	908	952
S98T000543		Lower half	791	911	851
S98T000540	228:4	Upper half	1,020	1,090	1,060
S98T000541		Lower half	976	828	902
S98T000576	228:5	Upper half	952	1,810	1,380[QC:e]
S98T000593		Lower half	2,850	1,160	2,010[QC:c,e]
S98T000607	228:6	Upper half	1,080	1,200	1,140[QC:a]
S98T000630		Lower half	1,110	1,140	1,130
S98T000631	228:7	Lower half	1,210	1,290	1,250
S98T000632	228:8	Upper half	1,150	1,220	1,190[QC:a]
S98T000633		Lower half	1,320	1,200	1,260
S98T000594	228:9	Upper half	1,260	1,350	1,310[QC:a]
S98T000595		Lower half	1,390	1,330	1,360
S98T000634	228:10	Lower half	1,890	1,770	1,830[QC:d]
S98T000774	228:11	Lower half	3,550	3,630	3,590
S98T000795	228:12	Lower half	2,590	2,980	2,790
S98T000796	228:13	Lower half	2,650	3,510	3,080[QC:e]
S98T000797	228:14	Lower half	2,890	2,810	2,850
S98T000798	228:15	Lower half	2,980	2,810	2,900
S98T000675	Core 226	Solid composite	1,990	2,920	2,460[QC:e]
S98T000998	Core 228	Solid composite	1,940	2,010	1,980

Table B2-39. Tank 241-AX-101 Analytical Results: Phosphorus (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**μg/mL**	**μg/mL**	**μg/mL**
S98T000090	226:1	Drainable liquid	1,010	1,010	1,010
S98T001009	226:8	Drainable liquid	802	872	837
S98T000295	226:11R	Drainable liquid	1,180	1,110	1,150
S98T000303	226:12	Drainable liquid	1,030	1,040	1,040
S98T000304	226:13	Drainable liquid	869	859	864
S98T000305	226:14	Drainable liquid	995	947	971
S98T000514	226:15	Drainable liquid	1,150	1,150	1,150
S98T000652	228:7	Drainable liquid	1,030	1,070	1,050
S98T000658	228:10	Drainable liquid	808	828	818
S98T000781	228:11	Drainable liquid	788	830	809
S98T000812	228:12	Drainable liquid	774	724	749
S98T000813	228:13	Drainable liquid	787	835	811
S98T000814	228:14	Drainable liquid	862	954	908[QC:d]
S98T000815	228:15	Drainable liquid	1,030	1,260	1,150[QC:e]
Solids: water digest			**μg/g**	**μg/g**	**μg/g**
S98T000731	226:5	Upper half	2,390	1,500	1,950[QC:e]
S98T000732		Lower half	1,910	1,370	1,640[QC:e]
S98T000733	226:11R	Upper half	2,430	2,570	2,500
S98T000734		Lower half	1,670	1,680	1,680
S98T000735	226:14	Lower half	566	552	559
S98T000736	228:5	Upper half	1,020	1,080	1,050
S98T000737		Lower half	1,230	1,090	1,160
S98T000777	228:11	Lower half	3,920	3,910	3,920
S98T000803	228:14	Lower half	2,770	3,010	2,890
S98T000729	Core 226	Solid composite	2,120	2,140	2,130
S98T001000	Core 228	Solid composite	2,140	2,140	2,140

Table B2-40. Tank 241-AX-101 Analytical Results: Potassium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**µg/g**	**µg/g**	**µg/g**
S98T000088	226:1	Lower half	993	785	889[QC:e]
S98T000095	226:2	Upper half	3,410	3,510	3,460
S98T000099		Lower half	3,590	3,660	3,630
S98T000127	226:3	Upper half	3,570	3,410	3,490
S98T000128		Lower half	3,150	3,320	3,240
S98T000129	226:4	Upper half	3,500	3,450	3,480
S98T000130		Lower half	3,550	3,520	3,540
S98T000131	226:5	Upper half	3,390	3,420	3,410
S98T000132		Lower half	3,310	3,140	3,230
S98T000159	226:6	Upper half	3,530	3,240	3,390
S98T000160		Lower half	3,480	3,500	3,490
S98T000161	226:7	Upper half	3,370	3,450	3,410
S98T000162		Lower half	3,250	3,490	3,370
S98T001005	226:8	Whole	1,960	1,210	1,590[QC:e]
S98T000229	226:9	Upper half	3,580	3,610	3,600
S98T000244		Lower half	3,420	3,580	3,500
S98T000273	226:10	Upper half	3,590	3,590	3,590
S98T000277		Lower half	3,820	3,590	3,710[QC:e]
S98T000274	226:11R	Upper half	4,010	4,070	4,040
S98T000278		Lower half	4,020	4,340	4,180
S98T000275	226:12	Upper half	3,980	4,000	3,990
S98T000279		Lower half	3,980	4,950	4,470[QC:e]
S98T000280	226:13	Whole	3,800	4,110	3,960
S98T000276	226:14	Upper half	2,820	3,110	2,970
S98T000281		Lower half	2,360	2,190	2,280
S98T000510	226:15	Lower half	2,390	3,980	3,190[QC:e]
S98T000544	228:2	Upper half	3,450	3,510	3,480
S98T000545		Lower half	3,260	3,210	3,240
S98T000542	228:3	Upper half	3,400	3,690	3,550
S98T000543		Lower half	3,220	3,390	3,310

Table B2-40. Tank 241-AX-101 Analytical Results: Potassium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			$\mu g/g$	$\mu g/g$	$\mu g/g$
S98T000540	228:4	Upper half	3,770	3,640	3,710
S98T000541		Lower half	3,350	3,060	3,210
S98T000576	228:5	Upper half	3,270	3,210	3,240
S98T000593		Lower half	2,630	3,160	2,900[QC:d]
S98T000607	228:6	Upper half	3,310	3,350	3,330
S98T000630		Lower half	3,200	3,280	3,240
S98T000631	228:7	Lower half	3,370	3,640	3,510
S98T000632	228:8	Upper half	3,050	3,460	3,260
S98T000633		Lower half	3,660	3,350	3,510
S98T000594	228:9	Upper half	3,590	3,770	3,680
S98T000595		Lower half	3,760	3,760	3,760
S98T000634	228:10	Lower half	4,110	3,950	4,030[QC:d]
S98T000774	228:11	Lower half	3,230	3,420	3,330
S98T000795	228:12	Lower half	3,480	3,740	3,610
S98T000796	228:13	Lower half	3,040	3,440	3,240
S98T000797	228:14	Lower half	2,970	3,080	3,030[QC:d]
S98T000798	228:15	Lower half	3,340	3,030	3,190
S98T000675	Core 226	Solid composite	2,100	2,120	2,110
S98T000998	Core 228	Solid composite	3,640	3,620	3,630
Liquids			$\mu g/mL$	$\mu g/mL$	$\mu g/mL$
S98T000090	226:1	Drainable liquid	2,050	1,990	2,020
S98T001009	226:8	Drainable liquid	3,190	3,420	3,310
S98T000295	226:11R	Drainable liquid	9,830	9,250	9,540[QC:c]
S98T000303	226:12	Drainable liquid	9,210	9,280	9,250
S98T000304	226:13	Drainable liquid	7,320	7,260	7,290
S98T000305	226:14	Drainable liquid	8,450	7,780	8,120[QC:c]
S98T000514	226:15	Drainable liquid	8,360	8,650	8,510
S98T000652	228:7	Drainable liquid	7,620	7,790	7,710
S98T000658	228:10	Drainable liquid	7,890	8,090	7,990
S98T000781	228:11	Drainable liquid	7,680	7,760	7,720

Table B2-40. Tank 241-AX-101 Analytical Results: Potassium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids (Cont'd)			**μg/mL**	**μg/mL**	**μg/mL**
S98T000812	228:12	Drainable liquid	8,110	7,980	8,050
S98T000813	228:13	Drainable liquid	7,610	8,070	7,840
S98T000814	228:14	Drainable liquid	8,740	8,860	8,800[QC:d]
S98T000815	228:15	Drainable liquid	9,840	12,000	10,900
Solids: water digest			**μg/g**	**μg/g**	**μg/g**
S98T000731	226:5	Upper half	3,550	3,630	3,590
S98T000732		Lower half	3,360	3,580	3,470
S98T000733	226:11R	Upper half	4,110	4,290	4,200
S98T000734		Lower half	4,330	4,270	4,300
S98T000735	226:14	Lower half	2,140	2,050	2,100
S98T000736	228:5	Upper half	3,430	3,330	3,380
S98T000737		Lower half	3,390	3,270	3,330
S98T000777	228:11	Lower half	3,270	3,090	3,180
S98T000803	228:14	Lower half	2,850	3,150	3,000
S98T000729	Core 226	Solid composite	2,210	2,110	2,160
S98T001000	Core 228	Solid composite	3,330	3,600	3,470

Table B2-41. Tank 241-AX-101 Analytical Results: Samarium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**μg/g**	**μg/g**	**μg/g**
S98T000088	226:1	Lower half	<59.7	<60	<59.9
S98T000095	226:2	Upper half	<39.8	<39.7	<39.8
S98T000099		Lower half	<60.1	<59.7	<59.9
S98T000127	226:3	Upper half	<38.8	<39.5	<39.1
S98T000128		Lower half	<59.9	<59.9	<59.9
S98T000129	226:4	Upper half	<40.8	<41.2	<41
S98T000130		Lower half	<59.4	<59.5	<59.5

Table B2-41. Tank 241-AX-101 Analytical Results: Samarium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000131	226:5	Upper half	<58	<58.7	<58.4
S98T000132		Lower half	<59.9	<59.8	<59.8
S98T000159	226:6	Upper half	<59	<58.7	<58.9
S98T000160		Lower half	<59.5	<59.6	<59.5
S98T000161	226:7	Upper half	<58.6	<59	<58.8
S98T000162		Lower half	<58.1	<58.9	<58.5
S98T001005	226:8	Whole	<59.5	<41.9	<50.7
S98T000229	226:9	Upper half	<57.4	<56.5	<57
S98T000244		Lower half	<58.9	<58.4	<58.6
S98T000273	226:10	Upper half	<58.8	<60.7	<59.8
S98T000277		Lower half	<60.7	<60.8	<60.8
S98T000274	226:11R	Upper half	<55.1	<54.6	<54.9
S98T000278		Lower half	<56.1	<54.8	<55.5
S98T000275	226:12	Upper half	<36.7	<40.6	<38.7
S98T000279		Lower half	<56.9	<56.9	<56.9
S98T000280	226:13	Whole	<56.1	<57.7	<56.9
S98T000276	226:14	Upper half	<39.1	<39.4	<39.3
S98T000281		Lower half	<60.7	<61	<60.9
S98T000510	226:15	Lower half	<58.6	<43.8	<51.2
S98T000544	228:2	Upper half	<59.7	<58.2	<59
S98T000545		Lower half	<57.1	<54.3	<55.7
S98T000542	228:3	Upper half	<56.7	<55.2	<56
S98T000543		Lower half	<55.1	<54	<54.5
S98T000540	228:4	Upper half	<56.3	<57	<56.6
S98T000541		Lower half	<57.7	<57	<57.4
S98T000576	228:5	Upper half	<58.9	<57.5	<58.2
S98T000593		Lower half	<57	<56	<56.5
S98T000607	228:6	Upper half	<51.6	<53.7	<52.7
S98T000630		Lower half	<57.1	<56.5	<56.8
S98T000631	228:7	Lower half	<56.5	<55.1	<55.8

Table B2-41. Tank 241-AX-101 Analytical Results: Samarium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000632	228:8	Upper half	<55	<56.3	<55.6
S98T000633		Lower half	<58.4	<56.8	<57.6
S98T000594	228:9	Upper half	<58.5	<57.5	<58
S98T000595		Lower half	<58.8	<59.3	<59
S98T000634	228:10	Lower half	<57.8	<59	<58.4
S98T000774	228:11	Lower half	<59.3	<56.9	<58.1
S98T000795	228:12	Lower half	<59.2	<57.7	<58.5
S98T000796	228:13	Lower half	<59.8	<59.3	<59.5
S98T000797	228:14	Lower half	<56.2	<57.4	<56.8
S98T000798	228:15	Lower half	<56.1	<54.9	<55.5
S98T000675	Core 226	Solid composite	<56.9	<55.8	<56.3
S98T000998	Core 228	Solid composite	<54.8	<54.2	<54.5
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<40.1	<40.1	<40.1
S98T001009	226:8	Drainable liquid	<60.1	<60.1	<60.1
S98T000295	226:11R	Drainable liquid	<60.1	<60.1	<60.1
S98T000303	226:12	Drainable liquid	<60.1	<60.1	<60.1
S98T000304	226:13	Drainable liquid	<60.1	<60.1	<60.1
S98T000305	226:14	Drainable liquid	<60.1	<60.1	<60.1
S98T000514	226:15	Drainable liquid	<60.1	<60.1	<60.1
S98T000652	228:7	Drainable liquid	<60.1	<60.1	<60.1
S98T000658	228:10	Drainable liquid	<40.1	<40.1	<40.1
S98T000781	228:11	Drainable liquid	<40.1	<40.1	<40.1
S98T000812	228:12	Drainable liquid	<40.1	<40.1	<40.1
S98T000813	228:13	Drainable liquid	<60.1	<60.1	<60.1
S98T000814	228:14	Drainable liquid	<60.1	<60.1	<60.1
S98T000815	228:15	Drainable liquid	<60.1	<60.1	<60.1

Table B2-41. Tank 241-AX-101 Analytical Results: Samarium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	<41.9	<41.7	<41.8
S98T000732		Lower half	<61.6	<60.8	<61.2
S98T000733	226:11R	Upper half	<37	<37.1	<37
S98T000734		Lower half	<40.8	<39.8	<40.3
S98T000735	226:14	Lower half	<60.1	<58.8	<59.5
S98T000736	228:5	Upper half	<55.4	<51.9	<53.6
S98T000737		Lower half	<54.1	<60.7	<57.4
S98T000777	228:11	Lower half	<55.4	<58.1	<56.8
S98T000803	228:14	Lower half	<62.9	<61.9	<62.4
S98T000729	Core 226	Solid composite	<57.6	<57	<57.3
S98T001000	Core 228	Solid composite	<60.3	<60.4	<60.3

Table B2-42. Tank 241-AX-101 Analytical Results: Selenium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**µg/g**	**µg/g**	**µg/g**
S98T000088	226:1	Lower half	<59.7	<60	<59.9
S98T000095	226:2	Upper half	<39.8	<39.7	<39.8
S98T000099		Lower half	<60.1	<59.7	<59.9
S98T000127	226:3	Upper half	<38.8	<39.5	<39.1
S98T000128		Lower half	<59.9	<59.9	<59.9
S98T000129	226:4	Upper half	<40.8	<41.2	<41
S98T000130		Lower half	<59.4	<59.5	<59.5
S98T000131	226:5	Upper half	<58	<58.7	<58.4
S98T000132		Lower half	<59.9	<59.8	<59.8
S98T000159	226:6	Upper half	<59	<58.7	<58.9
S98T000160		Lower half	<59.5	<59.6	<59.5
S98T000161	226:7	Upper half	<58.6	<59	<58.8
S98T000162		Lower half	<58.1	<58.9	<58.5

Table B2-42. Tank 241-AX-101 Analytical Results: Selenium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			µg/g	µg/g	µg/g
S98T001005	226:8	Whole	<59.5	<41.9	<50.7
S98T000229	226:9	Upper half	<57.4	<56.5	<57
S98T000244		Lower half	<58.9	<58.4	<58.6
S98T000273	226:10	Upper half	<58.8	<60.7	<59.8
S98T000277		Lower half	<60.7	<60.8	<60.8
S98T000274	226:11R	Upper half	<55.1	<54.6	<54.9
S98T000278		Lower half	<56.1	<54.8	<55.5
S98T000275	226:12	Upper half	<36.7	42.8	<39.8
S98T000279		Lower half	<56.9	<56.9	<56.9
S98T000280	226:13	Whole	<56.1	<57.7	<56.9
S98T000276	226:14	Upper half	<39.1	<39.4	<39.3
S98T000281		Lower half	<60.7	<61	<60.9
S98T000510	226:15	Lower half	<58.6	<43.8	<51.2
S98T000544	228:2	Upper half	<59.7	<58.2	<59
S98T000545		Lower half	<57.1	<54.3	<55.7
S98T000542	228:3	Upper half	<56.7	<55.2	<56
S98T000543		Lower half	<55.1	<54	<54.5
S98T000540	228:4	Upper half	<56.3	<57	<56.6
S98T000541		Lower half	<57.7	<57	<57.4
S98T000576	228:5	Upper half	<58.9	<57.5	<58.2
S98T000593		Lower half	<57	<56	<56.5
S98T000607	228:6	Upper half	<51.6	<53.7	<52.7
S98T000630		Lower half	<57.1	<56.5	<56.8
S98T000631	228:7	Lower half	<56.5	<55.1	<55.8
S98T000632	228:8	Upper half	<55	<56.3	<55.6
S98T000633		Lower half	<58.4	<56.8	<57.6
S98T000594	228:9	Upper half	<58.5	<57.5	<58
S98T000595		Lower half	<58.8	<59.3	<59
S98T000634	228:10	Lower half	<57.8	<59	<58.4
S98T000774	228:11	Lower half	<59.3	<56.9	<58.1

Table B2-42. Tank 241-AX-101 Analytical Results: Selenium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000795	228:12	Lower half	<59.2	<57.7	<58.5
S98T000796	228:13	Lower half	<59.8	<59.3	<59.5
S98T000797	228:14	Lower half	<56.2	<57.4	<56.8
S98T000798	228:15	Lower half	<56.1	<54.9	<55.5
S98T000675	Core 226	Solid composite	<56.9	<55.8	<56.3
S98T000998	Core 228	Solid composite	<54.8	<54.2	<54.5
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<40.1	<40.1	<40.1
S98T001009	226:8	Drainable liquid	<60.1	<60.1	<60.1
S98T000295	226:11R	Drainable liquid	<60.1	<60.1	<60.1
S98T000303	226:12	Drainable liquid	<60.1	<60.1	<60.1
S98T000304	226:13	Drainable liquid	<60.1	<60.1	<60.1
S98T000305	226:14	Drainable liquid	<60.1	<60.1	<60.1
S98T000514	226:15	Drainable liquid	61.2	64.1	62.6
S98T000652	228:7	Drainable liquid	<60.1	62.8	<61.5
S98T000658	228:10	Drainable liquid	44.3	45.9	45.1
S98T000781	228:11	Drainable liquid	47.9	48.5	48.2
S98T000812	228:12	Drainable liquid	56.7	57.6	57.2
S98T000813	228:13	Drainable liquid	<60.1	<60.1	<60.1
S98T000814	228:14	Drainable liquid	68.1	74.5	71.3
S98T000815	228:15	Drainable liquid	83.5	91.7	87.6
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	<41.9	<41.7	<41.8
S98T000732		Lower half	<61.6	<60.8	<61.2
S98T000733	226:11R	Upper half	<37	<37.1	<37
S98T000734		Lower half	<40.8	<39.8	<40.3
S98T000735	226:14	Lower half	<60.1	<58.8	<59.5
S98T000736	228:5	Upper half	<55.4	<51.9	<53.6
S98T000737		Lower half	<54.1	<60.7	<57.4
S98T000777	228:11	Lower half	<55.4	<58.1	<56.8

Table B2-42. Tank 241-AX-101 Analytical Results: Selenium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest (Cont'd)			μg/g	μg/g	μg/g
S98T000803	228:14	Lower half	<62.9	<61.9	<62.4
S98T000729	Core 226	Solid composite	<57.6	<57	<57.3
S98T001000	Core 228	Solid composite	<60.3	<60.4	<60.3

Table B2-43. Tank 241-AX-101 Analytical Results: Silicon (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			μg/g	μg/g	μg/g
S98T000088	226:1	Lower half	139	121	130[QC:a]
S98T000095	226:2	Upper half	144	157	151[QC:a]
S98T000099		Lower half	128	121	125[QC:a]
S98T000127	226:3	Upper half	105	109	107[QC:a]
S98T000128		Lower half	120	176	148[QC:a,c]
S98T000129	226:4	Upper half	159	144	152[QC:a]
S98T000130		Lower half	210	317	264[QC:a,c]
S98T000131	226:5	Upper half	139	134	137
S98T000132		Lower half	263	257	260[QC:a]
S98T000159	226:6	Upper half	140	131	136
S98T000160		Lower half	191	240	216[QC:a,e]
S98T000161	226:7	Upper half	124	127	126
S98T000162		Lower half	160	181	171
S98T001005	226:8	Whole	1,730	1,250	1,490[QC:e]
S98T000229	226:9	Upper half	190	192	191
S98T000244		Lower half	168	183	176
S98T000273	226:10	Upper half	198	160	179[QC:e]
S98T000277		Lower half	191	232	212
S98T000274	226:11R	Upper half	99	105	102
S98T000278		Lower half	68.5	106	87.3[QC:a,c]

Table B2-43. Tank 241-AX-101 Analytical Results: Silicon (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			µg/g	µg/g	µg/g
S98T000275	226:12	Upper half	114	107	111[QC:b]
S98T000279		Lower half	77	94.9	86[QC:a,e]
S98T000280	226:13	Whole	116	83.7	99.8[QC:a,c]
S98T000276	226:14	Upper half	127	131	129[QC:b]
S98T000281		Lower half	189	151	170[QC:a,e]
S98T000510	226:15	Lower half	121	262	192[QC:e]
S98T000544	228:2	Upper half	281	237	259[QC:a]
S98T000545		Lower half	284	276	280[QC:b]
S98T000542	228:3	Upper half	191	198	195[QC:a]
S98T000543		Lower half	222	222	222[QC:b]
S98T000540	228:4	Upper half	223	253	238[QC:a]
S98T000541		Lower half	162	157	160[QC:b]
S98T000576	228:5	Upper half	115	126	121
S98T000593		Lower half	131	156	144
S98T000607	228:6	Upper half	154	191	173[QC:a,e]
S98T000630		Lower half	196	200	198
S98T000631	228:7	Lower half	164	205	185[QC:c]
S98T000632	228:8	Upper half	190	213	202[QC:a]
S98T000633		Lower half	231	236	234
S98T000594	228:9	Upper half	223	252	238[QC:a]
S98T000595		Lower half	248	251	250[QC:b]
S98T000634	228:10	Lower half	141	148	145[QC:b]
S98T000774	228:11	Lower half	94.5	130	112[QC:e]
S98T000795	228:12	Lower half	156	254	205[QC:b,e]
S98T000796	228:13	Lower half	118	136	127[QC:b]
S98T000797	228:14	Lower half	139	107	123[QC:c]
S98T000798	228:15	Lower half	139	105	122[QC:b,e]
S98T000675	Core 226	Solid composite	187	200	194[QC:a]
S98T000998	Core 228	Solid composite	152	154	153[QC:a]

Table B2-43. Tank 241-AX-101 Analytical Results: Silicon (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**μg/mL**	**μg/mL**	**μg/mL**
S98T000090	226:1	Drainable liquid	122	141	132
S98T001009	226:8	Drainable liquid	226	259	243
S98T000295	226:11R	Drainable liquid	151	126	139
S98T000303	226:12	Drainable liquid	128	126	127
S98T000304	226:13	Drainable liquid	115	104	110
S98T000305	226:14	Drainable liquid	158	138	148
S98T000514	226:15	Drainable liquid	277	303	290
S98T000652	228:7	Drainable liquid	109	111	110
S98T000658	228:10	Drainable liquid	52.3	53	52.6
S98T000781	228:11	Drainable liquid	61.9	63.5	62.7
S98T000812	228:12	Drainable liquid	60.3	56.6	58.5
S98T000813	228:13	Drainable liquid	85.3	87.3	86.3
S98T000814	228:14	Drainable liquid	119	124	122
S98T000815	228:15	Drainable liquid	147	181	164[QC:e]
Solids: water digest			**μg/g**	**μg/g**	**μg/g**
S98T000731	226:5	Upper half	404	280	342[QC:e]
S98T000732		Lower half	964	400	682[QC:e]
S98T000733	226:11R	Upper half	1,160	487	824[QC:e]
S98T000734		Lower half	324	439	382[QC:e]
S98T000735	226:14	Lower half	422	312	367[QC:e]
S98T000736	228:5	Upper half	827	407	617[QC:e]
S98T000737		Lower half	958	525	742[QC:e]
S98T000777	228:11	Lower half	1,080	984	1,030
S98T000803	228:14	Lower half	983	1,290	1,140[QC:e]
S98T000729	Core 226	Solid composite	233	334	284[QC:e]
S98T001000	Core 228	Solid composite	218	234	226

Table B2-44. Tank 241-AX-101 Analytical Results: Silver (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**µg/g**	**µg/g**	**µg/g**
S98T000088	226:1	Lower half	12	8.34	10.2[QC:a,c,e]
S98T000095	226:2	Upper half	15.6	15.9	15.8
S98T000099		Lower half	16	15.2	15.6[QC:a]
S98T000127	226:3	Upper half	14.9	15.3	15.1
S98T000128		Lower half	14.6	14.1	14.3[QC:a]
S98T000129	226:4	Upper half	16.2	16.6	16.4
S98T000130		Lower half	36.8	30.6	33.7
S98T000131	226:5	Upper half	17.8	18.5	18.1
S98T000132		Lower half	19.1	17.9	18.5
S98T000159	226:6	Upper half	19.6	19.1	19.4
S98T000160		Lower half	30.5	32.2	31.4
S98T000161	226:7	Upper half	18.4	18.3	18.4
S98T000162		Lower half	18.1	19.9	19
S98T001005	226:8	Whole	22.2	14.6	18.4[QC:a,e]
S98T000229	226:9	Upper half	19.5	18.9	19.2
S98T000244		Lower half	18.7	20.1	19.4
S98T000273	226:10	Upper half	18.6	19.5	19.1
S98T000277		Lower half	17	17.4	17.2
S98T000274	226:11R	Upper half	14	13.8	13.9
S98T000278		Lower half	14.1	14	14.1
S98T000275	226:12	Upper half	12.8	12.6	12.7
S98T000279		Lower half	14.4	13.5	13.9
S98T000280	226:13	Whole	13.7	16.5	15.1
S98T000276	226:14	Upper half	14	13.9	13.9
S98T000281		Lower half	17.2	16.5	16.9
S98T000510	226:15	Lower half	15.6	13.1	14.3[QC:a]
S98T000544	228:2	Upper half	18	17.6	17.8[QC:a]
S98T000545		Lower half	18.1	18.5	18.3
S98T000542	228:3	Upper half	17.3	17.8	17.6[QC:a]
S98T000543		Lower half	18.3	17.9	18.1

Table B2-44. Tank 241-AX-101 Analytical Results: Silver (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000540	228:4	Upper half	17.2	17.6	17.4[QC:a]
S98T000541		Lower half	18.7	20.7	19.7
S98T000576	228:5	Upper half	16.6	16.9	16.8
S98T000593		Lower half	16.8	16.6	16.7
S98T000607	228:6	Upper half	17.4	17.6	17.5[QC:a]
S98T000630		Lower half	18.7	17.2	17.9
S98T000631	228:7	Lower half	16.9	15.8	16.4
S98T000632	228:8	Upper half	19	18.5	18.8[QC:a]
S98T000633		Lower half	23.9	20.1	22
S98T000594	228:9	Upper half	20.9	21.5	21.2[QC:a]
S98T000595		Lower half	19.5	19.2	19.4
S98T000634	228:10	Lower half	14.7	14.3	14.5
S98T000774	228:11	Lower half	14.4	13.8	14.1
S98T000795	228:12	Lower half	16.4	15.4	15.9
S98T000796	228:13	Lower half	14.9	14.4	14.7
S98T000797	228:14	Lower half	14.5	14.5	14.5
S98T000798	228:15	Lower half	14.4	14.6	14.5
S98T000675	Core 226	Solid composite	18.8	19.3	19.1[QC:a]
S98T000998	Core 228	Solid composite	15.2	16.1	15.7[QC:a]
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	14.4	14.4	14.4
S98T001009	226:8	Drainable liquid	12	13.1	12.6
S98T000295	226:11R	Drainable liquid	20.1	19.6	19.9[QC:d]
S98T000303	226:12	Drainable liquid	20.6	20.2	20.4
S98T000304	226:13	Drainable liquid	15	10.1	12.6[QC:e]
S98T000305	226:14	Drainable liquid	18.7	16.9	17.8[QC:c]
S98T000514	226:15	Drainable liquid	18.5	19.7	19.1
S98T000652	228:7	Drainable liquid	17.3	18.1	17.7
S98T000658	228:10	Drainable liquid	17	17.2	17.1
S98T000781	228:11	Drainable liquid	16.7	16.1	16.4

Table B2-44. Tank 241-AX-101 Analytical Results: Silver (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids (Cont'd)			**µg/mL**	**µg/mL**	**µg/mL**
S98T000812	228:12	Drainable liquid	16	16.6	16.3
S98T000813	228:13	Drainable liquid	16.9	17.4	17.1
S98T000814	228:14	Drainable liquid	20.1	20	20.1
S98T000815	228:15	Drainable liquid	22.8	25.7	24.3
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	15.5	15.6	15.6
S98T000732		Lower half	16	15.5	15.8
S98T000733	226:11R	Upper half	14.2	14.5	14.3
S98T000734		Lower half	13.9	14.9	14.4
S98T000735	226:14	Lower half	17.3	16.1	16.7
S98T000736	228:5	Upper half	16.9	16.6	16.8
S98T000737		Lower half	16.9	16.5	16.7
S98T000777	228:11	Lower half	16.2	15.3	15.8
S98T000803	228:14	Lower half	16.1	15.5	15.8
S98T000729	Core 226	Solid composite	17.4	16.4	16.9
S98T001000	Core 228	Solid composite	15.1	13.2	14.1

Table B2-45. Tank 241-AX-101 Analytical Results: Sodium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**µg/g**	**µg/g**	**µg/g**
S98T000088	226:1	Lower half	1.89E+05	1.93E+05	1.91E+05[QC:b]
S98T000095	226:2	Upper half	1.95E+05	1.97E+05	1.96E+05[QC:b]
S98T000099		Lower half	2.10E+05	2.09E+05	2.10E+05[QC:b]
S98T000127	226:3	Upper half	1.86E+05	1.93E+05	1.90E+05[QC:b]
S98T000128		Lower half	2.11E+05	2.10E+05	2.11E+05[QC:b]
S98T000129	226:4	Upper half	1.97E+05	2.01E+05	1.99E+05[QC:b]
S98T000130		Lower half	2.09E+05	2.09E+05	2.09E+05

Table B2-45. Tank 241-AX-101 Analytical Results: Sodium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			µg/g	µg/g	µg/g
S98T000131	226:5	Upper half	2.11E+05	2.13E+05	2.12E+05[QC:b]
S98T000132		Lower half	2.11E+05	2.08E+05	2.10E+05[QC:c]
S98T000159	226:6	Upper half	2.15E+05	2.15E+05	2.15E+05[QC:b]
S98T000160		Lower half	2.08E+05	2.06E+05	2.07E+05
S98T000161	226:7	Upper half	2.13E+05	2.15E+05	2.14E+05[QC:b]
S98T000162		Lower half	2.20E+05	2.17E+05	2.19E+05[QC:b]
S98T001005	226:8	Whole	1.32E+05	86,800	1.09E+05[QC:b,e]
S98T000229	226:9	Upper half	2.06E+05	2.03E+05	2.05E+05[QC:b]
S98T000244		Lower half	2.15E+05	2.16E+05	2.16E+05[QC:b]
S98T000273	226:10	Upper half	2.02E+05	2.04E+05	2.03E+05[QC:b]
S98T000277		Lower half	2.05E+05	2.04E+05	2.05E+05[QC:b,d]
S98T000274	226:11R	Upper half	1.86E+05	1.81E+05	1.84E+05[QC:b]
S98T000278		Lower half	1.91E+05	1.88E+05	1.90E+05[QC:b]
S98T000275	226:12	Upper half	1.86E+05	1.79E+05	1.83E+05[QC:b]
S98T000279		Lower half	1.96E+05	1.80E+05	1.88E+05[QC:b]
S98T000280	226:13	Whole	1.91E+05	1.81E+05	1.86E+05[QC:b]
S98T000276	226:14	Upper half	1.91E+05	1.95E+05	1.93E+05[QC:b]
S98T000281		Lower half	2.23E+05	2.26E+05	2.25E+05[QC:b,c]
S98T000510	226:15	Lower half	2.21E+05	1.89E+05	2.05E+05[QC:b]
S98T000544	228:2	Upper half	2.22E+05	2.16E+05	2.19E+05[QC:b]
S98T000545		Lower half	2.13E+05	2.14E+05	2.14E+05[QC:b,d]
S98T000542	228:3	Upper half	2.13E+05	2.12E+05	2.13E+05[QC:b]
S98T000543		Lower half	2.13E+05	2.10E+05	2.12E+05[QC:b]
S98T000540	228:4	Upper half	2.04E+05	2.12E+05	2.08E+05[QC:b]
S98T000541		Lower half	2.16E+05	2.16E+05	2.16E+05[QC:b]
S98T000576	228:5	Upper half	2.04E+05	2.05E+05	2.05E+05[QC:b]
S98T000593		Lower half	2.11E+05	2.02E+05	2.07E+05[QC:b,c,h]
S98T000607	228:6	Upper half	2.13E+05	2.15E+05	2.14E+05[QC:b]
S98T000630		Lower half	2.19E+05	2.06E+05	2.13E+05[QC:b]
S98T000631	228:7	Lower half	2.03E+05	1.98E+05	2.01E+05[QC:b]

Table B2-45. Tank 241-AX-101 Analytical Results: Sodium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000632	228:8	Upper half	2.19E+05	2.19E+05	2.19E+05[QC:b]
S98T000633		Lower half	2.12E+05	2.17E+05	2.15E+05[QC:b]
S98T000594	228:9	Upper half	2.15E+05	2.15E+05	2.15E+05[QC:b]
S98T000595		Lower half	2.17E+05	2.21E+05	2.19E+05[QC:b]
S98T000634	228:10	Lower half	2.01E+05	2.07E+05	2.04E+05[QC:b,d]
S98T000774	228:11	Lower half	2.04E+05	2.00E+05	2.02E+05
S98T000795	228:12	Lower half	2.09E+05	2.07E+05	2.08E+05[QC:b]
S98T000796	228:13	Lower half	1.98E+05	1.87E+05	1.93E+05
S98T000797	228:14	Lower half	2.08E+05	2.02E+05	2.05E+05[QC:c]
S98T000798	228:15	Lower half	1.99E+05	1.95E+05	1.97E+05
S98T000675	Core 226	Solid composite	2.35E+05	2.39E+05	2.37E+05[QC:b]
S98T000998	Core 228	Solid composite	2.03E+05	2.02E+05	2.03E+05[QC:b]
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	2.03E+05	1.99E+05	2.01E+05
S98T001009	226:8	Drainable liquid	1.75E+05	1.86E+05	1.81E+05
S98T000295	226:11R	Drainable liquid	2.91E+05	2.76E+05	2.84E+05[QC:c]
S98T000303	226:12	Drainable liquid	2.74E+05	2.75E+05	2.75E+05
S98T000304	226:13	Drainable liquid	2.28E+05	2.29E+05	2.29E+05
S98T000305	226:14	Drainable liquid	2.63E+05	2.45E+05	2.54E+05[QC:c]
S98T000514	226:15	Drainable liquid	2.58E+05	2.69E+05	2.64E+05
S98T000652	228:7	Drainable liquid	2.49E+05	2.54E+05	2.52E+05
S98T000658	228:10	Drainable liquid	2.37E+05	2.46E+05	2.42E+05[QC:c]
S98T000781	228:11	Drainable liquid	2.34E+05	2.35E+05	2.35E+05
S98T000812	228:12	Drainable liquid	2.32E+05	2.28E+05	2.30E+05
S98T000813	228:13	Drainable liquid	2.27E+05	2.44E+05	2.36E+05
S98T000814	228:14	Drainable liquid	2.71E+05	2.78E+05	2.75E+05[QC:d,h]
S98T000815	228:15	Drainable liquid	2.94E+05	3.59E+05	3.27E+05

Table B2-45. Tank 241-AX-101 Analytical Results: Sodium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			µg/g	µg/g	µg/g
S98T000731	226:5	Upper half	2.20E+05	2.17E+05	2.19E+05
S98T000732		Lower half	2.27E+05	2.22E+05	2.25E+05[QC:c]
S98T000733	226:11R	Upper half	2:03E+05	2.01E+05	2.02E+05
S98T000734		Lower half	1.94E+05	1.96E+05	1.95E+05
S98T000735	226:14	Lower half	2.29E+05	2.23E+05	2.26E+05[QC:c]
S98T000736	228:5	Upper half	2.21E+05	2.21E+05	2.21E+05
S98T000737		Lower half	2.23E+05	2.26E+05	2.25E+05[QC:c]
S98T000777	228:11	Lower half	2.13E+05	2.09E+05	2.11E+05
S98T000803	228:14	Lower half	2.16E+05	2.08E+05	2.12E+05[QC:c]
S98T000729	Core 226	Solid composite	2.36E+05	2.29E+05	2.33E+05
S98T001000	Core 228	Solid composite	2.06E+05	1.96E+05	2.01E+05

Table B2-46. Tank 241-AX-101 Analytical Results: Strontium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			µg/g	µg/g	µg/g
S98T000088	226:1	Lower half	<5.97	<6	<5.98
S98T000095	226:2	Upper half	<3.98	<3.97	<3.98
S98T000099		Lower half	<6.01	<5.97	<5.99
S98T000127	226:3	Upper half	<3.88	<3.95	<3.92
S98T000128		Lower half	<5.99	<5.99	<5.99
S98T000129	226:4	Upper half	<4.08	<4.12	<4.1
S98T000130		Lower half	<5.94	<5.95	<5.95
S98T000131	226:5	Upper half	<5.8	<5.87	<5.84
S98T000132		Lower half	<5.99	<5.98	<5.99
S98T000159	226:6	Upper half	<5.9	<5.87	<5.88
S98T000160		Lower half	<5.95	<5.96	<5.96
S98T000161	226:7	Upper half	<5.86	<5.9	<5.88
S98T000162		Lower half	<5.81	<5.89	<5.85

Table B2-46. Tank 241-AX-101 Analytical Results: Strontium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T001005	226:8	Whole	8.74	5.78	7.26[QC:e]
S98T000229	226:9	Upper half	<5.74	<5.65	<5.7
S98T000244		Lower half	<5.89	<5.84	<5.87
S98T000273	226:10	Upper half	<5.88	<6.07	<5.97
S98T000277		Lower half	<6.07	<6.08	<6.08
S98T000274	226:11R	Upper half	<5.51	<5.46	<5.48
S98T000278		Lower half	<5.61	<5.48	<5.54
S98T000275	226:12	Upper half	<3.67	<4.06	<3.86
S98T000279		Lower half	<5.69	<5.69	<5.69
S98T000280	226:13	Whole	<5.61	<5.77	<5.69
S98T000276	226:14	Upper half	<3.91	<3.94	<3.92
S98T000281		Lower half	<6.07	<6.1	<6.08
S98T000510	226:15	Lower half	<5.86	<4.38	<5.12[QC:e]
S98T000544	228:2	Upper half	<5.97	<5.82	<5.89
S98T000545		Lower half	<5.71	<5.43	<5.57
S98T000542	228:3	Upper half	<5.67	<5.52	<5.59
S98T000543		Lower half	<5.51	<5.4	<5.46
S98T000540	228:4	Upper half	<5.63	<5.7	<5.67
S98T000541		Lower half	<5.77	<5.7	<5.73
S98T000576	228:5	Upper half	<5.89	<5.75	<5.82
S98T000593		Lower half	<5.7	<5.6	<5.65
S98T000607	228:6	Upper half	<5.16	<5.37	<5.27
S98T000630		Lower half	<5.71	<5.65	<5.68
S98T000631	228:7	Lower half	<5.65	<5.51	<5.58
S98T000632	228:8	Upper half	<5.5	<5.63	<5.56
S98T000633		Lower half	<5.84	<5.68	<5.76
S98T000594	228:9	Upper half	<5.85	<5.75	<5.8
S98T000595		Lower half	<5.88	<5.93	<5.9
S98T000634	228:10	Lower half	<5.78	<5.9	<5.84
S98T000774	228:11	Lower half	<5.93	<5.69	<5.81

Table B2-46. Tank 241-AX-101 Analytical Results: Strontium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000795	228:12	Lower half	<5.92	<5.77	<5.84
S98T000796	228:13	Lower half	<5.98	<5.93	<5.96
S98T000797	228:14	Lower half	<5.62	<5.74	<5.68
S98T000798	228:15	Lower half	<5.61	<5.49	<5.55
S98T000675	Core 226	Solid composite	<5.69	<5.58	<5.63
S98T000998	Core 228	Solid composite	<5.48	<5.42	<5.45
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<4.01	<4.01	<4.01
S98T001009	226:8	Drainable liquid	<6.01	<6.01	<6.01
S98T000295	226:11R	Drainable liquid	<6.01	<6.01	<6.01
S98T000303	226:12	Drainable liquid	<6.01	<6.01	<6.01
S98T000304	226:13	Drainable liquid	<6.01	<6.01	<6.01
S98T000305	226:14	Drainable liquid	<6.01	<6.01	<6.01
S98T000514	226:15	Drainable liquid	<6.01	<6.01	<6.01
S98T000652	228:7	Drainable liquid	<6.01	<6.01	<6.01
S98T000658	228:10	Drainable liquid	<4.01	<4.01	<4.01
S98T000781	228:11	Drainable liquid	<4.01	<4.01	<4.01
S98T000812	228:12	Drainable liquid	<4.01	<4.01	<4.01
S98T000813	228:13	Drainable liquid	<6.01	<6.01	<6.01
S98T000814	228:14	Drainable liquid	<6.01	<6.01	<6.01
S98T000815	228:15	Drainable liquid	<6.01	<6.01	<6.01
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	<4.19	<4.17	<4.18
S98T000732		Lower half	<6.16	<6.08	<6.12
S98T000733	226:11R	Upper half	<3.7	<3.71	<3.71
S98T000734		Lower half	<4.08	<3.98	<4.03
S98T000735	226:14	Lower half	<6.01	<5.88	<5.95
S98T000736	228:5	Upper half	<5.54	<5.19	<5.37
S98T000737		Lower half	<5.41	<6.07	<5.74
S98T000777	228:11	Lower half	<5.54	<5.81	<5.67

Table B2-46. Tank 241-AX-101 Analytical Results: Strontium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest (Cont'd)			μg/g	μg/g	μg/g
S98T000803	228:14	Lower half	<6.29	<6.19	<6.24
S98T000729	Core 226	Solid composite	<5.76	<5.7	<5.73
S98T001000	Core 228	Solid composite	<6.03	<6.04	<6.04

Table B2-47. Tank 241-AX-101 Analytical Results: Sulfur (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			μg/g	μg/g	μg/g
S98T000088	226:1	Lower half	2,630	2,110	2,370[QC:c,e]
S98T000095	226:2	Upper half	7,430	7,570	7,500
S98T000099		Lower half	7,790	7,910	7,850
S98T000127	226:3	Upper half	4,640	5,880	5,260[QC:e]
S98T000128		Lower half	5,260	5,300	5,280
S98T000129	226:4	Upper half	6,930	6,690	6,810
S98T000130		Lower half	8,280	8,850	8,570
S98T000131	226:5	Upper half	7,620	7,930	7,780
S98T000132		Lower half	7,500	7,510	7,510
S98T000159	226:6	Upper half	8,380	8,260	8,320
S98T000160		Lower half	8,420	8,990	8,710
S98T000161	226:7	Upper half	8,530	8,710	8,620
S98T000162		Lower half	8,080	8,170	8,130
S98T001005	226:8	Whole	3,780	2,420	3,100[QC:e]
S98T000229	226:9	Upper half	8,420	8,410	8,420
S98T000244		Lower half	8,330	8,520	8,430
S98T000273	226:10	Upper half	7,760	8,080	7,920
S98T000277		Lower half	5,190	5,700	5,450[QC:d]
S98T000274	226:11R	Upper half	362	370	366
S98T000278		Lower half	330	349	340

Table B2-47. Tank 241-AX-101 Analytical Results: Sulfur (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			µg/g	µg/g	µg/g
S98T000275	226:12	Upper half	287	294	291
S98T000279		Lower half	304	369	337
S98T000280	226:13	Whole	295	329	312
S98T000276	226:14	Upper half	602	664	633
S98T000281		Lower half	284	267	276
S98T000510	226:15	Lower half	1,420	1,090	1,260[QC:e]
S98T000544	228:2	Upper half	9,270	8,690	8,980
S98T000545		Lower half	6,730	7,240	6,990[QC:d]
S98T000542	228:3	Upper half	8,190	8,300	8,250
S98T000543		Lower half	6,990	7,500	7,250
S98T000540	228:4	Upper half	7,420	8,230	7,830
S98T000541		Lower half	6,390	6,310	6,350
S98T000576	228:5	Upper half	7,320	7,870	7,600
S98T000593		Lower half	7,130	7,950	7,540[QC:d,h]
S98T000607	228:6	Upper half	7,150	7,770	7,460
S98T000630		Lower half	7,630	7,770	7,700
S98T000631	228:7	Lower half	6,070	6,210	6,140
S98T000632	228:8	Upper half	9,320	9,430	9,380
S98T000633		Lower half	8,680	8,220	8,450
S98T000594	228:9	Upper half	8,090	8,850	8,470
S98T000595		Lower half	8,890	9,120	9,010
S98T000634	228:10	Lower half	767	773	770
S98T000774	228:11	Lower half	262	269	266
S98T000795	228:12	Lower half	257	293	275
S98T000796	228:13	Lower half	245	272	259
S98T000797	228:14	Lower half	244	241	243
S98T000798	228:15	Lower half	264	245	255
S98T000675	Core 226	Solid composite	7,840	7,830	7,840
S98T000998	Core 228	Solid composite	5,060	5,550	5,310

Table B2-47. Tank 241-AX-101 Analytical Results: Sulfur (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	1,680	1,670	1,680
S98T001009	226:8	Drainable liquid	5,980	6,240	6,110
S98T000295	226:11R	Drainable liquid	734	693	714
S98T000303	226:12	Drainable liquid	648	652	650
S98T000304	226:13	Drainable liquid	540	538	539
S98T000305	226:14	Drainable liquid	696	658	677
S98T000514	226:15	Drainable liquid	789	801	795
S98T000652	228:7	Drainable liquid	1,070	1,100	1,090
S98T000658	228:10	Drainable liquid	455	458	457
S98T000781	228:11	Drainable liquid	434	510	472
S98T000812	228:12	Drainable liquid	525	418	472[QC:e]
S98T000813	228:13	Drainable liquid	554	585	570
S98T000814	228:14	Drainable liquid	635	706	671[QC:d]
S98T000815	228:15	Drainable liquid	717	876	797
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	8,160	8,080	8,120
S98T000732		Lower half	7,610	7,890	7,750
S98T000733	226:11R	Upper half	360	372	366
S98T000734		Lower half	332	328	330
S98T000735	226:14	Lower half	269	238	254
S98T000736	228:5	Upper half	8,270	8,120	8,200
S98T000737		Lower half	7,960	8,060	8,010
S98T000777	228:11	Lower half	251	246	249
S98T000803	228:14	Lower half	225	255	240
S98T000729	Core 226	Solid composite	7,920	7,430	7,680
S98T001000	Core 228	Solid composite	5,890	5,480	5,690

Table B2-48. Tank 241-AX-101 Analytical Results: Thallium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**µg/g**	**µg/g**	**µg/g**
S98T000088	226:1	Lower half	<119	<120	<120
S98T000095	226:2	Upper half	<79.7	<79.4	<79.6
S98T000099		Lower half	<120	<119	<120
S98T000127	226:3	Upper half	<77.6	<79	<78.3
S98T000128		Lower half	<120	<120	<120
S98T000129	226:4	Upper half	<81.6	<82.3	<81.9
S98T000130		Lower half	<119	<119	<119
S98T000131	226:5	Upper half	<116	<117	<117
S98T000132		Lower half	<120	<120	<120
S98T000159	226:6	Upper half	<118	<117	<118
S98T000160		Lower half	<119	<119	<119
S98T000161	226:7	Upper half	<117	<118	<118
S98T000162		Lower half	<116	<118	<117
S98T001005	226:8	Whole	<119	<83.8	<101
S98T000229	226:9	Upper half	<115	<113	<114
S98T000244		Lower half	<118	<117	<118
S98T000273	226:10	Upper half	<118	<121	<120
S98T000277		Lower half	<121	<122	<122
S98T000274	226:11R	Upper half	<110	<109	<110
S98T000278		Lower half	<112	<110	<111
S98T000275	226:12	Upper half	<73.4	<81.2	<77.3
S98T000279		Lower half	<114	<114	<114
S98T000280	226:13	Whole	<112	<115	<114
S98T000276	226:14	Upper half	<78.2	<78.8	<78.5
S98T000281		Lower half	<121	<122	<122
S98T000510	226:15	Lower half	<117	<87.6	<102
S98T000544	228:2	Upper half	<119	<116	<118
S98T000545		Lower half	<114	<109	<112
S98T000542	228:3	Upper half	<113	<110	<112
S98T000543		Lower half	<110	<108	<109

Table B2-48. Tank 241-AX-101 Analytical Results: Thallium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**μg/g**	**μg/g**	**μg/g**
S98T000540	228:4	Upper half	<113	<114	<114
S98T000541		Lower half	<115	<114	<115
S98T000576	228:5	Upper half	<118	<115	<117
S98T000593		Lower half	<114	<112	<113
S98T000607	228:6	Upper half	<103	<107	<105
S98T000630		Lower half	<114	<113	<114
S98T000631	228:7	Lower half	<113	<110	<112
S98T000632	228:8	Upper half	<110	<113	<112
S98T000633		Lower half	<117	<114	<116
S98T000594	228:9	Upper half	<117	<115	<116
S98T000595		Lower half	<118	<119	<119
S98T000634	228:10	Lower half	<116	<118	<117
S98T000774	228:11	Lower half	<119	<114	<117
S98T000795	228:12	Lower half	<118	<115	<117
S98T000796	228:13	Lower half	<120	<119	<120
S98T000797	228:14	Lower half	<112	<115	<114
S98T000798	228:15	Lower half	<112	<110	<111
S98T000675	Core 226	Solid composite	<114	<112	<113
S98T000998	Core 228	Solid composite	<110	<108	<109
Liquids			**μg/mL**	**μg/mL**	**μg/mL**
S98T000090	226:1	Drainable liquid	<80.2	<80.2	<80.2
S98T001009	226:8	Drainable liquid	<120	<120	<120
S98T000295	226:11R	Drainable liquid	<120	<120	<120
S98T000303	226:12	Drainable liquid	<120	<120	<120
S98T000304	226:13	Drainable liquid	<120	<120	<120
S98T000305	226:14	Drainable liquid	<120	<120	<120
S98T000514	226:15	Drainable liquid	<120	<120	<120
S98T000652	228:7	Drainable liquid	<120	<120	<120
S98T000658	228:10	Drainable liquid	<80.2	<80.2	<80.2
S98T000781	228:11	Drainable liquid	<80.2	<80.2	<80.2

Table B2-48. Tank 241-AX-101 Analytical Results: Thallium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids (Cont'd)			**µg/mL**	**µg/mL**	**µg/mL**
S98T000812	228:12	Drainable liquid	<80.2	<80.2	<80.2
S98T000813	228:13	Drainable liquid	<120	<120	<120
S98T000814	228:14	Drainable liquid	<120	<120	<120
S98T000815	228:15	Drainable liquid	<120	<120	<120
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	<83.9	<83.5	<83.7
S98T000732		Lower half	<123	<122	<123
S98T000733	226:11R	Upper half	<74	<74.1	<74
S98T000734		Lower half	<81.6	<79.6	<80.6
S98T000735	226:14	Lower half	<120	<118	<119
S98T000736	228:5	Upper half	<111	<104	<108
S98T000737		Lower half	<108	<121	<115
S98T000777	228:11	Lower half	<111	<116	<114
S98T000803	228:14	Lower half	<126	<124	<125
S98T000729	Core 226	Solid composite	<115	<114	<115
S98T001000	Core 228	Solid composite	<121	<121	<121

Table B2-49. Tank 241-AX-101 Analytical Results: Titanium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**µg/g**	**µg/g**	**µg/g**
S98T000088	226:1	Lower half	<5.97	<6	<5.98
S98T000095	226:2	Upper half	<3.98	<3.97	<3.98
S98T000099		Lower half	<6.01	<5.97	<5.99
S98T000127	226:3	Upper half	<3.88	<3.95	<3.92
S98T000128		Lower half	<5.99	<5.99	<5.99
S98T000129	226:4	Upper half	<4.08	<4.12	<4.1
S98T000130		Lower half	<5.94	<5.95	<5.95

Table B2-49. Tank 241-AX-101 Analytical Results: Titanium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000131	226:5	Upper half	<5.8	<5.87	<5.84
S98T000132		Lower half	<5.99	<5.98	<5.99
S98T000159	226:6	Upper half	<5.9	<5.87	<5.88
S98T000160		Lower half	<5.95	<5.96	<5.96
S98T000161	226:7	Upper half	<5.86	<5.9	<5.88
S98T000162		Lower half	<5.81	<5.89	<5.85
S98T001005	226:8	Whole	<5.95	<4.19	<5.07
S98T000229	226:9	Upper half	<5.74	<5.65	<5.7
S98T000244		Lower half	<5.89	<5.84	<5.87
S98T000273	226:10	Upper half	<5.88	<6.07	<5.97
S98T000277		Lower half	<6.07	<6.08	<6.08
S98T000274	226:11R	Upper half	<5.51	<5.46	<5.48
S98T000278		Lower half	<5.61	<5.48	<5.54
S98T000275	226:12	Upper half	<3.67	<4.06	<3.86
S98T000279		Lower half	<5.69	<5.69	<5.69
S98T000280	226:13	Whole	<5.61	<5.77	<5.69
S98T000276	226:14	Upper half	<3.91	<3.94	<3.92
S98T000281		Lower half	<6.07	<6.1	<6.08
S98T000510	226:15	Lower half	<5.86	<4.38	<5.12
S98T000544	228:2	Upper half	<5.97	<5.82	<5.89
S98T000545		Lower half	<5.71	<5.43	<5.57
S98T000542	228:3	Upper half	<5.67	<5.52	<5.59
S98T000543		Lower half	<5.51	<5.4	<5.46
S98T000540	228:4	Upper half	<5.63	<5.7	<5.67
S98T000541		Lower half	<5.77	<5.7	<5.73
S98T000576	228:5	Upper half	<5.89	<5.75	<5.82
S98T000593		Lower half	<5.7	<5.6	<5.65
S98T000607	228:6	Upper half	<5.16	<5.37	<5.27
S98T000630		Lower half	<5.71	<5.65	<5.68
S98T000631	228:7	Lower half	<5.65	<5.51	<5.58

Table B2-49. Tank 241-AX-101 Analytical Results: Titanium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000632	228:8	Upper half	<5.5	<5.63	<5.56
S98T000633		Lower half	<5.84	<5.68	<5.76
S98T000594	228:9	Upper half	<5.85	<5.75	<5.8
S98T000595		Lower half	<5.88	<5.93	<5.9
S98T000634	228:10	Lower half	<5.78	<5.9	<5.84
S98T000774	228:11	Lower half	<5.93	<5.69	<5.81
S98T000795	228:12	Lower half	<5.92	<5.77	<5.84
S98T000796	228:13	Lower half	<5.98	<5.93	<5.96
S98T000797	228:14	Lower half	<5.62	<5.74	<5.68
S98T000798	228:15	Lower half	<5.61	<5.49	<5.55
S98T000675	Core 226	Solid composite	<5.69	<5.58	<5.63
S98T000998	Core 228	Solid composite	<5.48	<5.42	<5.45
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<4.01	<4.01	<4.01
S98T001009	226:8	Drainable liquid	<6.01	<6.01	<6.01
S98T000295	226:11R	Drainable liquid	<6.01	<6.01	<6.01
S98T000303	226:12	Drainable liquid	<6.01	<6.01	<6.01
S98T000304	226:13	Drainable liquid	<6.01	<6.01	<6.01
S98T000305	226:14	Drainable liquid	<6.01	<6.01	<6.01
S98T000514	226:15	Drainable liquid	<6.01	<6.01	<6.01
S98T000652	228:7	Drainable liquid	<6.01	<6.01	<6.01
S98T000658	228:10	Drainable liquid	<4.01	<4.01	<4.01
S98T000781	228:11	Drainable liquid	<4.01	<4.01	<4.01
S98T000812	228:12	Drainable liquid	<4.01	<4.01	<4.01
S98T000813	228:13	Drainable liquid	<6.01	<6.01	<6.01
S98T000814	228:14	Drainable liquid	<6.01	<6.01	<6.01
S98T000815	228:15	Drainable liquid	<6.01	<6.01	<6.01

Table B2-49. Tank 241-AX-101 Analytical Results: Titanium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	<4.19	<4.17	<4.18
S98T000732		Lower half	<6.16	<6.08	<6.12
S98T000733	226:11R	Upper half	<3.7	<3.71	<3.71
S98T000734		Lower half	<4.08	<3.98	<4.03
S98T000735	226:14	Lower half	<6.01	<5.88	<5.95
S98T000736	228:5	Upper half	<5.54	<5.19	<5.37
S98T000737		Lower half	<5.41	<6.07	<5.74
S98T000777	228:11	Lower half	<5.54	<5.81	<5.67
S98T000803	228:14	Lower half	<6.29	<6.19	<6.24
S98T000729	Core 226	Solid composite	<5.76	<5.7	<5.73
S98T001000	Core 228	Solid composite	<6.03	<6.04	<6.04

Table B2-50. Tank 241-AX-101 Analytical Results: Total Uranium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**µg/g**	**µg/g**	**µg/g**
S98T000088	226:1	Lower half	<298	<300	<299
S98T000095	226:2	Upper half	247	246	247
S98T000099		Lower half	<300	<298	<299
S98T000127	226:3	Upper half	244	303	274[QC:e]
S98T000128		Lower half	<299	<299	<299
S98T000129	226:4	Upper half	388	383	386
S98T000130		Lower half	430	480	455
S98T000131	226:5	Upper half	412	410	411
S98T000132		Lower half	457	466	462
S98T000159	226:6	Upper half	573	559	566
S98T000160		Lower half	510	526	518
S98T000161	226:7	Upper half	561	540	551
S98T000162		Lower half	436	476	456

Table B2-50. Tank 241-AX-101 Analytical Results: Total Uranium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T001005	226:8	Whole	2,380	1,580	1,980[QC:e]
S98T000229	226:9	Upper half	589	593	591
S98T000244		Lower half	559	619	589
S98T000273	226:10	Upper half	596	641	619
S98T000277		Lower half	314	372	343
S98T000274	226:11R	Upper half	<275	<273	<274
S98T000278		Lower half	<280	<274	<277
S98T000275	226:12	Upper half	<183	<203	<193
S98T000279		Lower half	<285	<284	<285
S98T000280	226:13	Whole	<281	<288	<285
S98T000276	226:14	Upper half	<196	<197	<197
S98T000281		Lower half	<304	<305	<305
S98T000510	226:15	Lower half	<293	<219	<256
S98T000544	228:2	Upper half	413	412	413
S98T000545		Lower half	323	315	319
S98T000542	228:3	Upper half	435	468	452
S98T000543		Lower half	393	458	426
S98T000540	228:4	Upper half	462	490	476
S98T000541		Lower half	416	416	416
S98T000576	228:5	Upper half	431	440	436
S98T000593		Lower half	413	455	434
S98T000607	228:6	Upper half	411	444	428
S98T000630		Lower half	427	428	428
S98T000631	228:7	Lower half	359	371	365
S98T000632	228:8	Upper half	642	675	659
S98T000633		Lower half	878	775	827
S98T000594	228:9	Upper half	947	1,020	984
S98T000595		Lower half	539	529	534
S98T000634	228:10	Lower half	<289	<295	<292
S98T000774	228:11	Lower half	<296	<285	<291

Table B2-50. Tank 241-AX-101 Analytical Results: Total Uranium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000795	228:12	Lower half	<296	<289	<293
S98T000796	228:13	Lower half	<299	<296	<298
S98T000797	228:14	Lower half	<281	<287	<284
S98T000798	228:15	Lower half	<280	<275	<278
S98T000675	Core 226	Solid composite	484	476	480
S98T000998	Core 228	Solid composite	340	385	363
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<200	<200	<200
S98T001009	226:8	Drainable liquid	<300	<300	<300
S98T000295	226:11R	Drainable liquid	<300	<300	<300
S98T000303	226:12	Drainable liquid	<300	<300	<300
S98T000304	226:13	Drainable liquid	<300	<300	<300
S98T000305	226:14	Drainable liquid	<300	<300	<300
S98T000514	226:15	Drainable liquid	<300	<300	<300
S98T000652	228:7	Drainable liquid	<300	<300	<300
S98T000658	228:10	Drainable liquid	<200	<200	<200
S98T000781	228:11	Drainable liquid	<200	<200	<200
S98T000812	228:12	Drainable liquid	<200	<200	<200
S98T000813	228:13	Drainable liquid	<300	<300	<300
S98T000814	228:14	Drainable liquid	<300	<300	<300
S98T000815	228:15	Drainable liquid	<300	<300	<300
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	<210	<209	<210
S98T000732		Lower half	<308	<304	<306
S98T000733	226:11R	Upper half	<185	<185	<185
S98T000734		Lower half	<204	<199	<202
S98T000735	226:14	Lower half	<301	<294	<298
S98T000736	228:5	Upper half	<277	<260	<269
S98T000737		Lower half	<271	<304	<288
S98T000777	228:11	Lower half	<277	<290	<284

Table B2-50. Tank 241-AX-101 Analytical Results: Total Uranium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000803	228:14	Lower half	<315	<309	<312
S98T000729	Core 226	Solid composite	<288	<285	<287
S98T001000	Core 228	Solid composite	<302	<302	<302

Table B2-51. Tank 241-AX-101 Analytical Results: Vanadium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**µg/g**	**µg/g**	**µg/g**
S98T000088	226:1	Lower half	<29.8	<30	<29.9
S98T000095	226:2	Upper half	<19.9	<19.8	<19.9
S98T000099		Lower half	<30	<29.8	<29.9
S98T000127	226:3	Upper half	<19.4	<19.8	<19.6
S98T000128		Lower half	<29.9	<29.9	<29.9
S98T000129	226:4	Upper half	<20.4	<20.6	<20.5
S98T000130		Lower half	<29.7	<29.8	<29.8
S98T000131	226:5	Upper half	<29	<29.4	<29.2
S98T000132		Lower half	<30	<29.9	<29.9
S98T000159	226:6	Upper half	<29.5	<29.3	<29.4
S98T000160		Lower half	<29.8	<29.8	<29.8
S98T000161	226:7	Upper half	<29.3	<29.5	<29.4
S98T000162		Lower half	<29.1	<29.4	<29.3
S98T001005	226:8	Whole	<29.8	<20.9	<25.4
S98T000229	226:9	Upper half	<28.7	<28.2	<28.4
S98T000244		Lower half	<29.4	<29.2	<29.3
S98T000273	226:10	Upper half	<29.4	<30.3	<29.9
S98T000277		Lower half	<30.4	<30.4	<30.4
S98T000274	226:11R	Upper half	<27.5	<27.3	<27.4
S98T000278		Lower half	<28	<27.4	<27.7

Table B2-51. Tank 241-AX-101 Analytical Results: Vanadium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000275	226:12	Upper half	<18.3	<20.3	<19.3
S98T000279		Lower half	<28.5	<28.4	<28.4
S98T000280	226:13	Whole	<28.1	<28.8	<28.5
S98T000276	226:14	Upper half	<19.6	<19.7	<19.6
S98T000281		Lower half	<30.4	<30.5	<30.4
S98T000510	226:15	Lower half	<29.3	<21.9	<25.6
S98T000544	228:2	Upper half	<29.8	<29.1	<29.5
S98T000545		Lower half	<28.6	<27.2	<27.9
S98T000542	228:3	Upper half	<28.3	<27.6	<28
S98T000543		Lower half	<27.6	<27	<27.3
S98T000540	228:4	Upper half	<28.2	<28.5	<28.4
S98T000541		Lower half	<28.8	<28.5	<28.6
S98T000576	228:5	Upper half	<29.4	<28.8	<29.1
S98T000593		Lower half	<28.5	<28	<28.3
S98T000607	228:6	Upper half	<25.8	<26.9	<26.4
S98T000630		Lower half	<28.5	<28.3	<28.4
S98T000631	228:7	Lower half	<28.3	<27.6	<28
S98T000632	228:8	Upper half	<27.5	<28.2	<27.9
S98T000633		Lower half	<29.2	<28.4	<28.8
S98T000594	228:9	Upper half	<29.3	<28.7	<29
S98T000595		Lower half	<29.4	<29.6	<29.5
S98T000634	228:10	Lower half	<28.9	<29.5	<29.2
S98T000774	228:11	Lower half	<29.6	<28.5	<29.1
S98T000795	228:12	Lower half	<29.6	<28.9	<29.3
S98T000796	228:13	Lower half	<29.9	<29.6	<29.8
S98T000797	228:14	Lower half	<28.1	<28.7	<28.4
S98T000798	228:15	Lower half	<28	<27.5	<27.8
S98T000675	Core 226	Solid composite	<28.5	<27.9	<28.2
S98T000998	Core 228	Solid composite	<27.4	<27.1	<27.3

Table B2-51. Tank 241-AX-101 Analytical Results: Vanadium (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<20.1	<20.1	<20.1
S98T001009	226:8	Drainable liquid	<30.1	<30.1	<30.1
S98T000295	226:11R	Drainable liquid	<30.1	<30.1	<30.1
S98T000303	226:12	Drainable liquid	<30.1	<30.1	<30.1
S98T000304	226:13	Drainable liquid	<30.1	<30.1	<30.1
S98T000305	226:14	Drainable liquid	<30.1	<30.1	<30.1
S98T000514	226:15	Drainable liquid	<30.1	<30.1	<30.1
S98T000652	228:7	Drainable liquid	<30.1	<30.1	<30.1
S98T000658	228:10	Drainable liquid	<20.1	<20.1	<20.1
S98T000781	228:11	Drainable liquid	<20.1	<20.1	<20.1
S98T000812	228:12	Drainable liquid	<20.1	<20.1	<20.1
S98T000813	228:13	Drainable liquid	<30.1	<30.1	<30.1
S98T000814	228:14	Drainable liquid	<30.1	<30.1	<30.1
S98T000815	228:15	Drainable liquid	<30.1	<30.1	<30.1
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	<21	<20.9	<20.9
S98T000732		Lower half	<30.8	<30.4	<30.6
S98T000733	226:11R	Upper half	<18.5	<18.5	<18.5
S98T000734		Lower half	<20.4	<19.9	<20.1
S98T000735	226:14	Lower half	<30.1	<29.4	<29.8
S98T000736	228:5	Upper half	<27.7	<26	<26.9
S98T000737		Lower half	<27.1	<30.4	<28.8
S98T000777	228:11	Lower half	<27.7	<29	<28.4
S98T000803	228:14	Lower half	<31.5	<30.9	<31.2
S98T000729	Core 226	Solid composite	<28.8	<28.5	<28.6
S98T001000	Core 228	Solid composite	<30.2	<30.2	<30.2

Table B2-52. Tank 241-AX-101 Analytical Results: Zinc (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			µg/g	µg/g	µg/g
S98T000088	226:1	Lower half	18.8	24	21.4[QC:e]
S98T000095	226:2	Upper half	29.6	30.8	30.2
S98T000099		Lower half	14.5	14.6	14.6
S98T000127	226:3	Upper half	30.5	29.9	30.2
S98T000128		Lower half	13.5	18.8	16.1[QC:e]
S98T000129	226:4	Upper half	29	29.2	29.1
S98T000130		Lower half	73.3	35.1	54.2[QC:e]
S98T000131	226:5	Upper half	29.3	30.4	29.9
S98T000132		Lower half	37.4	37.6	37.5
S98T000159	226:6	Upper half	31.9	28.5	30.2
S98T000160		Lower half	36.6	39.4	38
S98T000161	226:7	Upper half	30.6	35.9	33.3
S98T000162		Lower half	148	151	150
S98T001005	226:8	Whole	31.4	22	26.7[QC:e]
S98T000229	226:9	Upper half	22	21.1	21.6
S98T000244		Lower half	151	154	153
S98T000273	226:10	Upper half	29.6	30.5	30.1
S98T000277		Lower half	149	128	139
S98T000274	226:11R	Upper half	15.7	15.8	15.8
S98T000278		Lower half	72.8	66.5	69.7
S98T000275	226:12	Upper half	13.9	36.4	25.1[QC:e]
S98T000279		Lower half	69.9	68.7	69.3
S98T000280	226:13	Whole	70.1	75	72.5
S98T000276	226:14	Upper half	18.6	20	19.3
S98T000281		Lower half	72.4	77.8	75.1
S98T000510	226:15	Lower half	14.5	5.84	10.2[QC:e]
S98T000544	228:2	Upper half	7.96	<5.82	<6.89[QC:e]
S98T000545		Lower half	18.7	17.8	18.3
S98T000542	228:3	Upper half	9.65	8.33	8.99
S98T000543		Lower half	20.8	35.6	28.2[QC:e]

Table B2-52. Tank 241-AX-101 Analytical Results: Zinc (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**μg/g**	**μg/g**	**μg/g**
S98T000540	228:4	Upper half	6.84	11.8	9.32[QC:e]
S98T000541		Lower half	20.1	32.8	26.4[QC:e]
S98T000576	228:5	Upper half	10.5	9.8	10.2
S98T000593		Lower half	8.02	7.24	7.63
S98T000607	228:6	Upper half	8.34	8.76	8.55
S98T000630		Lower half	20.4	17.9	19.1
S98T000631	228:7	Lower half	19	22.8	20.9
S98T000632	228:8	Upper half	10.6	10	10.3
S98T000633		Lower half	24.4	23	23.7
S98T000594	228:9	Upper half	14.7	13.6	14.1
S98T000595		Lower half	23.3	26.6	25
S98T000634	228:10	Lower half	19.6	18	18.8
S98T000774	228:11	Lower half	14.7	14.4	14.6
S98T000795	228:12	Lower half	14	13.6	13.8
S98T000796	228:13	Lower half	24	15.7	19.9[QC:e]
S98T000797	228:14	Lower half	16.8	17.7	17.3
S98T000798	228:15	Lower half	13.8	13.8	13.8
S98T000675	Core 226	Solid composite	32.1	37.7	34.9
S98T000998	Core 228	Solid composite	6.57	6.95	6.76
Liquids			**μg/mL**	**μg/mL**	**μg/mL**
S98T000090	226:1	Drainable liquid	<4.01	<4.01	<4.01
S98T001009	226:8	Drainable liquid	<6.01	<6.01	<6.01
S98T000295	226:11R	Drainable liquid	<6.01	<6.01	<6.01
S98T000303	226:12	Drainable liquid	<6.01	<6.01	<6.01
S98T000304	226:13	Drainable liquid	<6.01	<6.01	<6.01
S98T000305	226:14	Drainable liquid	<6.01	<6.01	<6.01
S98T000514	226:15	Drainable liquid	<6.01	<6.01	<6.01
S98T000652	228:7	Drainable liquid	<6.01	<6.01	<6.01
S98T000658	228:10	Drainable liquid	<4.01	<4.01	<4.01
S98T000781	228:11	Drainable liquid	<4.01	<4.01	<4.01

Table B2-52. Tank 241-AX-101 Analytical Results: Zinc (ICP). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids (Cont'd)			**μg/mL**	**μg/mL**	**μg/mL**
S98T000812	228:12	Drainable liquid	<4.01	<4.01	<4.01
S98T000813	228:13	Drainable liquid	<6.01	<6.01	<6.01
S98T000814	228:14	Drainable liquid	<6.01	<6.01	<6.01
S98T000815	228:15	Drainable liquid	<6.01	<6.01	<6.01
Solids: water digest			**μg/g**	**μg/g**	**μg/g**
S98T000731	226:5	Upper half	<4.19	<4.17	<4.18
S98T000732		Lower half	<6.16	<6.08	<6.12
S98T000733	226:11R	Upper half	<3.7	<3.71	<3.71
S98T000734		Lower half	<4.08	<3.98	<4.03
S98T000735	226:14	Lower half	<6.01	<5.88	<5.95
S98T000736	228:5	Upper half	<5.54	<5.19	<5.37
S98T000737		Lower half	<5.41	<6.07	<5.74
S98T000777	228:11	Lower half	<5.54	<5.81	<5.67
S98T000803	228:14	Lower half	<6.29	<6.19	<6.24
S98T000729	Core 226	Solid composite	<5.76	<5.7	<5.73
S98T001000	Core 228	Solid composite	<6.03	<6.04	<6.04

Table B2-53. Tank 241-AX-101 Analytical Results: Zirconium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest			**μg/g**	**μg/g**	**μg/g**
S98T000088	226:1	Lower half	6.85	<6	<6.42[QC:c]
S98T000095	226:2	Upper half	12.8	12.8	12.8
S98T000099		Lower half	15.6	11.6	13.6[QC:c]
S98T000127	226:3	Upper half	13.3	16.8	15.1[QC:e]
S98T000128		Lower half	13.8	13.3	13.6
S98T000129	226:4	Upper half	20.6	20.1	20.4
S98T000130		Lower half	22.4	25	23.7

Table B2-53. Tank 241-AX-101 Analytical Results: Zirconium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			µg/g	µg/g	µg/g
S98T000131	226:5	Upper half	20.6	20.8	20.7
S98T000132		Lower half	24.4	25.1	24.8
S98T000159	226:6	Upper half	27.3	26.6	27
S98T000160		Lower half	26.6	27.7	27.1
S98T000161	226:7	Upper half	27.1	25.6	26.4
S98T000162		Lower half	19.5	22.9	21.2
S98T001005	226:8	Whole	111	74.1	92.5[QC:e]
S98T000229	226:9	Upper half	27.8	28.6	28.2
S98T000244		Lower half	25.6	33	29.3[QC:e]
S98T000273	226:10	Upper half	27.9	33	30.4
S98T000277		Lower half	19.7	21.9	20.8
S98T000274	226:11R	Upper half	<5.51	<5.46	<5.48
S98T000278		Lower half	<5.61	<5.48	<5.54
S98T000275	226:12	Upper half	4.57	5	4.79
S98T000279		Lower half	<5.69	<5.69	<5.69
S98T000280	226:13	Whole	<5.61	<5.77	<5.69
S98T000276	226:14	Upper half	5.02	5.29	5.15
S98T000281		Lower half	<6.07	<6.1	<6.08
S98T000510	226:15	Lower half	<5.86	<4.38	<5.12
S98T000544	228:2	Upper half	21.4	21.1	21.3
S98T000545		Lower half	14.6	13.6	14.1
S98T000542	228:3	Upper half	22.2	24	23.1
S98T000543		Lower half	16.7	23.8	20.3[QC:e]
S98T000540	228:4	Upper half	22.7	25.4	24
S98T000541		Lower half	20.3	21.6	21
S98T000576	228:5	Upper half	22.3	23	22.6
S98T000593		Lower half	20.7	23.1	21.9
S98T000607	228:6	Upper half	21.7	23.4	22.5[QC:a]
S98T000630		Lower half	20.8	18	19.4
S98T000631	228:7	Lower half	18.3	18.9	18.6

Table B2-53. Tank 241-AX-101 Analytical Results: Zirconium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: acid digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000632	228:8	Upper half	36.5	36.9	36.7[QC:a]
S98T000633		Lower half	35.6	38.3	37
S98T000594	228:9	Upper half	51.7	60.4	56[QC:a]
S98T000595		Lower half	34	32.1	33
S98T000634	228:10	Lower half	<5.78	<5.9	<5.84
S98T000774	228:11	Lower half	<5.93	<5.69	<5.81
S98T000795	228:12	Lower half	<5.92	<5.77	<5.84
S98T000796	228:13	Lower half	<5.98	7.18	<6.58
S98T000797	228:14	Lower half	<5.62	<5.74	<5.68
S98T000798	228:15	Lower half	6.43	<5.49	<5.96
S98T000675	Core 226	Solid composite	26.5	26	26.3
S98T000998	Core 228	Solid composite	20.1	21.7	20.9
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<4.01	<4.01	<4.01
S98T001009	226:8	Drainable liquid	<6.01	<6.01	<6.01
S98T000295	226:11R	Drainable liquid	<6.01	<6.01	<6.01
S98T000303	226:12	Drainable liquid	<6.01	<6.01	<6.01
S98T000304	226:13	Drainable liquid	<6.01	<6.01	<6.01
S98T000305	226:14	Drainable liquid	<6.01	<6.01	<6.01
S98T000514	226:15	Drainable liquid	<6.01	<6.01	<6.01
S98T000652	228:7	Drainable liquid	<6.01	<6.01	<6.01
S98T000658	228:10	Drainable liquid	<4.01	<4.01	<4.01
S98T000781	228:11	Drainable liquid	<4.01	<4.01	<4.01
S98T000812	228:12	Drainable liquid	<4.01	<4.01	<4.01
S98T000813	228:13	Drainable liquid	<6.01	<6.01	<6.01
S98T000814	228:14	Drainable liquid	<6.01	<6.01	<6.01
S98T000815	228:15	Drainable liquid	<6.01	<6.01	<6.01

Table B2-53. Tank 241-AX-101 Analytical Results: Zirconium (ICP). (4 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000731	226:5	Upper half	<4.19	<4.17	<4.18
S98T000732		Lower half	<6.16	<6.08	<6.12
S98T000733	226:11R	Upper half	<3.7	<3.71	<3.71
S98T000734		Lower half	<4.08	<3.98	<4.03
S98T000735	226:14	Lower half	<6.01	<5.88	<5.95
S98T000736	228:5	Upper half	<5.54	<5.19	<5.37
S98T000737		Lower half	<5.41	<6.07	<5.74
S98T000777	228:11	Lower half	<5.54	<5.81	<5.67
S98T000803	228:14	Lower half	<6.29	<6.19	<6.24
S98T000729	Core 226	Solid composite	<5.76	<5.7	<5.73
S98T001000	Core 228	Solid composite	<6.03	<6.04	<6.04

Table B2-54. Tank 241-AX-101 Analytical Results: Total Uranium.

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S98T000125	226:5	Upper half	461	416	439
S98T000126		Lower half	466	484	475
S98T000265	226:11R	Upper half	8.9	8.27	8.59[QC:f]
S98T000269		Lower half	3.41	3.14	3.28[QC:f]
S98T000272	226:14	Lower half	20.2	19.3	19.8[QC:f]
S98T000575	228:5	Upper half	409	468	439
S98T000590		Lower half	396	408	402
S98T000773	228:11	Lower half	2.26	2.54	2.4[QC:f]
S98T000793	228:14	Lower half	52.2	54.5	53.4
S98T000674	Core 226	Solid composite	432	456	444
S98T000997	Core 228	Solid composite	357	381	369

Table B2-55. Tank 241-AX-101 Analytical Results: Bromide (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			μg/g	μg/g	μg/g
S98T000089	226:1	Lower half	3,880	3,620	3,750
S98T000096	226:2	Upper half	<2,450	<2,420	<2,440
S98T000100		Lower half	<1,250	<1,260	<1,260
S98T000133	226:3	Upper half	3,540	3,680	3,610
S98T000134		Lower half	<1,240	<1,230	<1,240
S98T000135	226:4	Upper half	3,300	3,300	3,300
S98T000136		Lower half	<1,020	<1,010	<1,010
S98T000137	226:5	Upper half	1,080	1,120	1,100
S98T000138		Lower half	<1,020	<1,010	<1,020
S98T000163	226:6	Upper half	1,340	1,400	1,370
S98T000164		Lower half	<1,010	<1,010	<1,010
S98T000165	226:7	Upper half	1,650	1,690	1,670
S98T000166		Lower half	420	426	423
S98T001006	226:8	Whole	<1,010	<994	<1,000
S98T000230	226:9	Upper half	843	837	840
S98T000245		Lower half	494	476	485
S98T000282	226:10	Upper half	947	937	942
S98T000286		Lower half	515	515	515
S98T000283	226:11R	Upper half	<923	<925	<924
S98T000287		Lower half	<1,020	<994	<1,010
S98T000284	226:12	Upper half	<950	<982	<966
S98T000288		Lower half	<1,060	<1,080	<1,070
S98T000289	226:13	Whole	1,050	<1,030	<1,040
S98T000285	226:14	Upper half	1,110	1,150	1,130
S98T000290		Lower half	<1,000	<996	<999
S98T000511	226:15	Lower half	1,040	1,160	1,100
S98T000550	228:2	Upper half	<1,010	1,020	<,1020
S98T000551		Lower half	<523	<524	<524
S98T000548	228:3	Upper half	<957	<948	<953
S98T000549		Lower half	<526	<509	<517

Table B2-55. Tank 241-AX-101 Analytical Results: Bromide (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000546	228:4	Upper half	<996	<973	<985
S98T000547		Lower half	<986	564	<775[QC:e]
S98T000577	228:5	Upper half	1,050	990	1,020
S98T000596		Lower half	1,020	1,120	1,070
S98T000608	228:6	Upper half	651	635	643
S98T000635		Lower half	<1,010	<997	<1,000
S98T000636	228:7	Lower half	1,210	1,210	1,210
S98T000637	228:8	Upper half	1,250	1,170	1,210
S98T000638		Lower half	<1,020	<1,020	<1,020
S98T000597	228:9	Upper half	<512	<511	<511
S98T000598		Lower half	1,130	1,130	1,130
S98T000639	228:10	Lower half	1,120	1,140	1,130
S98T000776	228:11	Lower half	1,360	1,410	1,380
S98T000799	228:12	Lower half	1,070	1,100	1,090
S98T000800	228:13	Lower half	1,200	1,170	1,180
S98T000801	228:14	Lower half	1,550	1,590	1,570
S98T000802	228:15	Lower half	<986	<1,000	<993
S98T000676	Core 226	Solid composite	1,220	1,190	1,210
S98T000999	Core 228	Solid composite	1,290	1,270	1,280
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	161	159	160
S98T001009	226:8	Drainable liquid	<1,280	<644	<960
S98T000295	226:11R	Drainable liquid	<1,280	<1,280	<1,280
S98T000303	226:12	Drainable liquid	<1,280	<1,280	<1,280
S98T000304	226:13	Drainable liquid	2,080	2,070	2,070
S98T000305	226:14	Drainable liquid	2,210	2,240	2,230
S98T000514	226:15	Drainable liquid	1,220	1,220	1,220
S98T000652	228:7	Drainable liquid	2,480	2,620	2,550
S98T000658	228:10	Drainable liquid	<1,280	<1,280	<1,280
S98T000781	228:11	Drainable liquid	2,850	2,920	2,890

Table B2-55. Tank 241-AX-101 Analytical Results: Bromide (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids (Cont'd)			μg/mL	μg/mL	μg/mL
S98T000812	228:12	Drainable liquid	1,120	1,090	1,100
S98T000813	228:13	Drainable liquid	<1,280	<1,280	<1,280
S98T000814	228:14	Drainable liquid	2,240	2,220	2,230
S98T000815	228:15	Drainable liquid	1,110	1,080	1,100

Table B2-56. Tank 241-AX-101 Analytical Results: Chloride (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			μg/g	μg/g	μg/g
S98T000089	226:1	Lower half	859	917	888
S98T000096	226:2	Upper half	3,930	3,730	3,830
S98T000100		Lower half	3,870	3,190	3,530
S98T000133	226:3	Upper half	4,010	3,890	3,950
S98T000134		Lower half	3,500	3,410	3,450
S98T000135	226:4	Upper half	4,200	4,170	4,180
S98T000136		Lower half	4,080	3,750	3,920
S98T000137	226:5	Upper half	4,200	4,210	4,210
S98T000138		Lower half	3,590	3,680	3,630
S98T000163	226:6	Upper half	3,890	4,080	3,980
S98T000164		Lower half	3,700	3,890	3,800
S98T000165	226:7	Upper half	4,020	4,260	4,140
S98T000166		Lower half	4,590	4,330	4,460
S98T001006	226:8	Whole	2,380	2,460	2,420
S98T000230	226:9	Upper half	4,750	4,520	4,630
S98T000245		Lower half	4,110	4,050	4,080
S98T000282	226:10	Upper half	4,710	4,760	4,730
S98T000286		Lower half	4,650	5,020	4,840
S98T000283	226:11R	Upper half	5,280	5,480	5,380
S98T000287		Lower half	4,340	4,210	4,280

Table B2-56. Tank 241-AX-101 Analytical Results: Chloride (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest (Cont'd)			µg/g	µg/g	µg/g
S98T000284	226:12	Upper half	3,940	4,040	3,990
S98T000288		Lower half	4,130	4,630	4,380
S98T000289	226:13	Whole	4,070	3,740	3,900
S98T000285	226:14	Upper half	2,930	3,150	3,040
S98T000290		Lower half	2,100	1,870	1,990
S98T000511	226:15	Lower half	3,590	2,930	3,260[QC:e]
S98T000550	228:2	Upper half	4,140	4,190	4,160
S98T000551		Lower half	3,890	3,890	3,890
S98T000548	228:3	Upper half	4,540	3,620	4,080[QC:e]
S98T000549		Lower half	3,250	3,850	3,550
S98T000546	228:4	Upper half	3,870	3,270	3,570
S98T000547		Lower half	4,560	3,790	4,170
S98T000577	228:5	Upper half	3,730	3,860	3,790
S98T000596		Lower half	4,000	3,710	3,850
S98T000608	228:6	Upper half	3,420	3,670	3,540
S98T000635		Lower half	3,290	3,570	3,430
S98T000636	228:7	Lower half	3,520	3,580	3,550
S98T000637	228:8	Upper half	4,210	3,540	3,870
S98T000638		Lower half	3,830	3,730	3,780
S98T000597	228:9	Upper half	3,990	4,770	4,380
S98T000598		Lower half	4,290	4,380	4,340
S98T000639	228:10	Lower half	4,360	4,350	4,350
S98T000776	228:11	Lower half	4,020	4,150	4,080
S98T000799	228:12	Lower half	3,540	3,490	3,520
S98T000800	228:13	Lower half	4,930	3,910	4,420[QC:e]
S98T000801	228:14	Lower half	3,450	3,910	3,680
S98T000802	228:15	Lower half	3,540	3,510	3,520
S98T000676	Core 226	Solid composite	2,720	2,570	2,640
S98T000999	Core 228	Solid composite	4,380	4,590	4,490

Table B2-56. Tank 241-AX-101 Analytical Results: Chloride (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	22	21.9	21.9
S98T001009	226:8	Drainable liquid	3,530	3,420	3,480
S98T000295	226:11R	Drainable liquid	9,640	9,430	9,540
S98T000303	226:12	Drainable liquid	8,710	8,690	8,700
S98T000304	226:13	Drainable liquid	8,690	8,620	8,650
S98T000305	226:14	Drainable liquid	9,450	9,310	9,380
S98T000514	226:15	Drainable liquid	9,240	9,200	9,220
S98T000652	228:7	Drainable liquid	10,600	10,500	10,500
S98T000658	228:10	Drainable liquid	9,020	8,660	8,840
S98T000781	228:11	Drainable liquid	10,900	10,200	10,600
S98T000812	228:12	Drainable liquid	9,410	9,330	9,370
S98T000813	228:13	Drainable liquid	19,400	21,800	20,600
S98T000814	228:14	Drainable liquid	9,770	9,780	9,770
S98T000815	228:15	Drainable liquid	10,300	10,400	10,400

Table B2-57. Tank 241-AX-101 Analytical Results: Fluoride (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000089	226:1	Lower half	555	517	536
S98T000096	226:2	Upper half	524	468	496
S98T000100		Lower half	<120	<121	<121
S98T000133	226:3	Upper half	821	798	809
S98T000134		Lower half	299	<118	<209[QC:e]
S98T000135	226:4	Upper half	474	560	517
S98T000136		Lower half	419	589	504[QC:e]
S98T000137	226:5	Upper half	590	400	495[QC:e]
S98T000138		Lower half	483	348	415[QC:e]

Table B2-57. Tank 241-AX-101 Analytical Results: Fluoride (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest (Cont'd)			µg/g	µg/g	µg/g
S98T000163	226:6	Upper half	1,650	839	1,240[QC:e]
S98T000164		Lower half	613	651	632
S98T000165	226:7	Upper half	869	953	911
S98T000166		Lower half	924	978	951
S98T001006	226:8	Whole	470	494	482
S98T000230	226:9	Upper half	902	908	905
S98T000245		Lower half	1,050	1,080	1,070
S98T000282	226:10	Upper half	895	861	878
S98T000286		Lower half	754	684	719
S98T000283	226:11R	Upper half	495	484	490
S98T000287		Lower half	312	311	312
S98T000284	226:12	Upper half	426	422	424
S98T000288		Lower half	350	376	363
S98T000289	226:13	Whole	366	352	359
S98T000285	226:14	Upper half	469	474	472
S98T000290		Lower half	203	197	200
S98T000511	226:15	Lower half	506	520	513
S98T000550	228:2	Upper half	310	307	309
S98T000551		Lower half	269	241	255[QC:c]
S98T000548	228:3	Upper half	<91.9	270	<181[QC:e]
S98T000549		Lower half	538	408	473[QC:e]
S98T000546	228:4	Upper half	448	528	488
S98T000547		Lower half	684	625	654
S98T000577	228:5	Upper half	470	487	479
S98T000596		Lower half	558	538	548
S98T000608	228:6	Upper half	478	492	485
S98T000635		Lower half	613	575	594
S98T000636	228:7	Lower half	616	648	632
S98T000637	228:8	Upper half	827	749	788
S98T000638		Lower half	964	1,020	992

Table B2-57. Tank 241-AX-101 Analytical Results: Fluoride (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest (Cont'd)			**μg/g**	**μg/g**	**μg/g**
S98T000597	228:9	Upper half	938	977	957
S98T000598		Lower half	914	951	932
S98T000639	228:10	Lower half	359	340	350
S98T000776	228:11	Lower half	500	545	523
S98T000799	228:12	Lower half	377	370	373
S98T000800	228:13	Lower half	428	389	409
S98T000801	228:14	Lower half	421	432	427[QC:c]
S98T000802	228:15	Lower half	406	401	403
S98T000676	Core 226	Solid composite	741	716	729
S98T000999	Core 228	Solid composite	621	616	618
Liquids			**μg/mL**	**μg/mL**	**μg/mL**
S98T000090	226:1	Drainable liquid	3.4	3.49	3.44
S98T001009	226:8	Drainable liquid	564	462	513
S98T000295	226:11R	Drainable liquid	<122	<122	<122
S98T000303	226:12	Drainable liquid	<122	<122	<122
S98T000304	226:13	Drainable liquid	<61.8	<61.8	<61.8
S98T000305	226:14	Drainable liquid	<61.8	<61.8	<61.8[QC:c]
S98T000514	226:15	Drainable liquid	<61.8	<61.8	<61.8
S98T000652	228:7	Drainable liquid	<122	<122	<122
S98T000658	228:10	Drainable liquid	<122	<122	<122
S98T000781	228:11	Drainable liquid	<122	<122	<122
S98T000812	228:12	Drainable liquid	<61.8	<61.8	<61.8
S98T000813	228:13	Drainable liquid	<122	<122	<122
S98T000814	228:14	Drainable liquid	<61.8	<61.8	<61.8[QC:c]
S98T000815	228:15	Drainable liquid	<61.8	<61.8	<61.8

Table B2-58. Tank 241-AX-101 Analytical Results: Nitrate (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000089	226:1	Lower half	4.00E+05	4.05E+05	4.02E+05
S98T000096	226:2	Upper half	1.92E+05	1.90E+05	1.91E+05
S98T000100		Lower half	1.06E+05	2.18E+05	1.62E+05[QC:e]
S98T000133	226:3	Upper half	2.19E+05	1.87E+05	2.03E+05
S98T000134		Lower half	1.93E+05	1.99E+05	1.96E+05
S98T000135	226:4	Upper half	1.85E+05	1.72E+05	1.79E+05
S98T000136		Lower half	1.00E+05	1.10E+05	1.05E+05
S98T000137	226:5	Upper half	<596	<593	<595
S98T000138		Lower half	1.58E+05	1.30E+05	1.44E+05
S98T000163	226:6	Upper half	1.47E+05	1.59E+05	1.53E+05
S98T000164		Lower half	1.37E+05	1.05E+05	1.21E+05[QC:e]
S98T000165	226:7	Upper half	1.56E+05	1.19E+05	1.38E+05[QC:e]
S98T000166		Lower half	1.11E+05	1.10E+05	1.10E+05
S98T001006	226:8	Whole	60,600	60,000	60,300
S98T000230	226:9	Upper half	1.19E+05	1.20E+05	1.20E+05
S98T000245		Lower half	1.58E+05	1.68E+05	1.63E+05
S98T000282	226:10	Upper half	1.34E+05	1.33E+05	1.33E+05
S98T000286		Lower half	1.23E+05	1.18E+05	1.21E+05
S98T000283	226:11R	Upper half	2.42E+05	2.39E+05	2.41E+05
S98T000287		Lower half	1.90E+05	2.01E+05	1.96E+05
S98T000284	226:12	Upper half	2.67E+05	2.66E+05	2.66E+05
S98T000288		Lower half	2.10E+05	2.30E+05	2.20E+05
S98T000289	226:13	Whole	1.86E+05	1.84E+05	1.85E+05
S98T000285	226:14	Upper half	3.15E+05	3.05E+05	3.10E+05
S98T000290		Lower half	4.18E+05	3.88E+05	4.03E+05[QC:e]
S98T000511	226:15	Lower half	2.83E+05	3.31E+05	3.07E+05
S98T000550	228:2	Upper half	1.62E+05	1.66E+05	1.64E+05
S98T000551		Lower half	1.56E+05	1.48E+05	1.52E+05
S98T000548	228:3	Upper half	1.54E+05	1.25E+05	1.40E+05[QC:e]
S98T000549		Lower half	1.66E+05	1.66E+05	1.66E+05

Table B2-58. Tank 241-AX-101 Analytical Results: Nitrate (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000546	228:4	Upper half	1.44E+05	2.03E+05	1.74E+05[QC:e]
S98T000547		Lower half	1.59E+05	1.56E+05	1.57E+05
S98T000577	228:5	Upper half	1.66E+05	1.70E+05	1.68E+05
S98T000596		Lower half	1.59E+05	1.83E+05	1.71E+05
S98T000608	228:6	Upper half	2.33E+05	1.83E+05	2.08E+05[QC:e]
S98T000635		Lower half	1.88E+05	1.77E+05	1.82E+05
S98T000636	228:7	Lower half	1.48E+05	1.70E+05	1.59E+05
S98T000637	228:8	Upper half	1.54E+05	2.10E+05	1.82E+05[QC:e]
S98T000638		Lower half	1.38E+05	1.43E+05	1.41E+05
S98T000597	228:9	Upper half	1.36E+05	1.47E+05	1.41E+05
S98T000598		Lower half	1.22E+05	1.20E+05	1.21E+05
S98T000639	228:10	Lower half	2.51E+05	2.34E+05	2.42E+05
S98T000776	228:11	Lower half	3.05E+05	3.07E+05	3.06E+05
S98T000799	228:12	Lower half	2.85E+05	2.97E+05	2.91E+05
S98T000800	228:13	Lower half	1.93E+05	2.56E+05	2.25E+05[QC:e]
S98T000801	228:14	Lower half	3.46E+05	3.07E+05	3.27E+05
S98T000802	228:15	Lower half	3.09E+05	3.16E+05	3.12E+05
S98T000676	Core 226	Solid composite	3.05E+05	3.01E+05	3.03E+05
S98T000999	Core 228	Solid composite	1.74E+05	1.49E+05	1.61E+05
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	3,370	3,370	3,370
S98T001009	226:8	Drainable liquid	94,800	95,300	95,000
S98T000295	226:11R	Drainable liquid	1.45E+05	1.45E+05	1.45E+05
S98T000303	226:12	Drainable liquid	1.28E+05	1.28E+05	1.28E+05
S98T000304	226:13	Drainable liquid	1.50E+05	1.49E+05	1.49E+05
S98T000305	226:14	Drainable liquid	1.65E+05	1.64E+05	1.64E+05
S98T000514	226:15	Drainable liquid	1.46E+05	1.45E+05	1.46E+05
S98T000652	228:7	Drainable liquid	1.66E+05	1.70E+05	1.68E+05
S98T000658	228:10	Drainable liquid	1.41E+05	1.44E+05	1.43E+05
S98T000781	228:11	Drainable liquid	1.52E+05	1.54E+05	1.53E+05

Table B2-58. Tank 241-AX-101 Analytical Results: Nitrate (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids (Cont'd)			µg/mL	µg/mL	µg/mL
S98T000812	228:12	Drainable liquid	1.37E+05	1.35E+05	1.36E+05
S98T000813	228:13	Drainable liquid	2.90E+05	3.28E+05	3.09E+05
S98T000814	228:14	Drainable liquid	1.56E+05	1.56E+05	1.56E+05
S98T000815	228:15	Drainable liquid	1.52E+05	1.54E+05	1.53E+05

Table B2-59. Tank 241-AX-101 Analytical Results: Nitrite (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			µg/g	µg/g	µg/g
S98T000089	226:1	Lower half	16,900	15,400	16,100
S98T000096	226:2	Upper half	69,900	69,200	69,500
S98T000100		Lower half	74,900	64,700	69,800
S98T000133	226:3	Upper half	64,900	68,400	66,700
S98T000134		Lower half	68,600	68,300	68,400
S98T000135	226:4	Upper half	73,000	71,300	72,100
S98T000136		Lower half	78,800	74,500	76,600
S98T000137	226:5	Upper half	81,700	82,300	82,000
S98T000138		Lower half	71,100	74,400	72,800
S98T000163	226:6	Upper half	76,100	79,200	77,700
S98T000164		Lower half	75,500	77,900	76,700
S98T000165	226:7	Upper half	79,400	85,200	82,300
S98T000166		Lower half	82,000	81,600	81,800
S98T001006	226:8	Whole	44,400	45,400	44,900
S98T000230	226:9	Upper half	90,900	88,200	89,500
S98T000245		Lower half	75,600	78,100	76,800
S98T000282	226:10	Upper half	88,800	88,300	88,600
S98T000286		Lower half	84,600	89,600	87,100
S98T000283	226:11R	Upper half	1.17E+05	1.18E+05	1.17E+05
S98T000287		Lower half	1.09E+05	1.09E+05	1.09E+05

Table B2-59. Tank 241-AX-101 Analytical Results: Nitrite (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000284	226:12	Upper half	1.03E+05	1.07E+05	1.05E+05
S98T000288		Lower half	1.11E+05	1.18E+05	1.14E+05
S98T000289	226:13	Whole	1.05E+05	99,900	1.02E+05
S98T000285	226:14	Upper half	73,100	76,600	74,800
S98T000290		Lower half	43,000	38,700	40,800
S98T000511	226:15	Lower half	88,700	89,800	89,300
S98T000550	228:2	Upper half	72,500	77,700	75,100
S98T000551		Lower half	77,100	77,600	77,300
S98T000548	228:3	Upper half	85,600	74,100	79,800
S98T000549		Lower half	63,600	74,800	69,200
S98T000546	228:4	Upper half	69,100	67,700	68,400
S98T000547		Lower half	74,700	73,000	73,800
S98T000577	228:5	Upper half	77,900	78,100	78,000
S98T000596		Lower half	82,500	76,900	79,700
S98T000608	228:6	Upper half	64,000	66,400	65,200
S98T000635		Lower half	68,800	70,400	69,600
S98T000636	228:7	Lower half	75,700	76,800	76,300
S98T000637	228:8	Upper half	84,900	69,100	77,000[QC:e]
S98T000638		Lower half	79,600	79,800	79,700
S98T000597	228:9	Upper half	80,900	95,500	88,200
S98T000598		Lower half	85,000	85,900	85,500
S98T000639	228:10	Lower half	1.12E+05	1.07E+05	1.09E+05
S98T000776	228:11	Lower half	1.14E+05	1.10E+05	1.12E+05
S98T000799	228:12	Lower half	1.35E+05	1.30E+05	1.32E+05
S98T000800	228:13	Lower half	1.22E+05	1.28E+05	1.25E+05
S98T000801	228:14	Lower half	1.01E+05	1.08E+05	1.04E+05
S98T000802	228:15	Lower half	1.27E+05	1.21E+05	1.24E+05
S98T000676	Core 226	Solid composite	62,700	56,900	59,800
S98T000999	Core 228	Solid composite	92,200	95,600	93,900

Table B2-59. Tank 241-AX-101 Analytical Results: Nitrite (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	408	406	407
S98T001009	226:8	Drainable liquid	69,000	69,500	69,200
S98T000295	226:11R	Drainable liquid	1.71E+05	1.66E+05	1.69E+05
S98T000303	226:12	Drainable liquid	1.52E+05	1.49E+05	1.51E+05
S98T000304	226:13	Drainable liquid	1.55E+05	1.55E+05	1.55E+05
S98T000305	226:14	Drainable liquid	1.71E+05	1.72E+05	1.71E+05
S98T000514	226:15	Drainable liquid	1.63E+05	1.62E+05	1.62E+05
S98T000652	228:7	Drainable liquid	1.84E+05	1.79E+05	1.81E+05
S98T000658	228:10	Drainable liquid	1.50E+05	1.48E+05	1.49E+05
S98T000781	228:11	Drainable liquid	1.61E+05	1.64E+05	1.62E+05
S98T000812	228:12	Drainable liquid	1.49E+05	1.46E+05	1.48E+05
S98T000813	228:13	Drainable liquid	3.16E+05	3.54E+05	3.35E+05
S98T000814	228:14	Drainable liquid	1.68E+05	1.67E+05	1.68E+05
S98T000815	228:15	Drainable liquid	1.70E+05	1.66E+05	1.68E+05

Table B2-60. Tank 241-AX-101 Analytical Results: Phosphate (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000089	226:1	Lower half	7,540	7,280	7,410
S98T000096	226:2	Upper half	6,800	6,680	6,740
S98T000100		Lower half	5,380	4,280	4,830[QC:e]
S98T000133	226:3	Upper half	9,710	9,670	9,690
S98T000134		Lower half	3,870	3,200	3,540
S98T000135	226:4	Upper half	5,080	6,940	6,010[QC:e]
S98T000136		Lower half	5,200	7,370	6,280[QC:e]
S98T000137	226:5	Upper half	7,450	4,800	6,120[QC:e]
S98T000138		Lower half	5,200	4,060	4,630[QC:e]

Table B2-60. Tank 241-AX-101 Analytical Results: Phosphate (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000163	226:6	Upper half	13,000	4,770	8,880[QC:e]
S98T000164		Lower half	3,870	3,780	3,820
S98T000165	226:7	Upper half	4,270	4,770	4,520
S98T000166		Lower half	5,600	6,150	5,880
S98T001006	226:8	Whole	2,420	2,550	2,480
S98T000230	226:9	Upper half	4,330	4,260	4,290
S98T000245		Lower half	5,240	6,260	5,750
S98T000282	226:10	Upper half	4,470	4,310	4,390
S98T000286		Lower half	5,810	5,400	5,610
S98T000283	226:11R	Upper half	7,880	8,010	7,940
S98T000287		Lower half	4,630	4,590	4,610
S98T000284	226:12	Upper half	8,650	9,200	8,930
S98T000288		Lower half	4,990	5,870	5,430
S98T000289	226:13	Whole	7,860	7,120	7,490
S98T000285	226:14	Upper half	7,460	8,050	7,750
S98T000290		Lower half	2,120	2,000	2,060
S98T000511	226:15	Lower half	4,170	4,890	4,530
S98T000550	228:2	Upper half	4,530	4,290	4,410
S98T000551		Lower half	3,170	2,820	2,990
S98T000548	228:3	Upper half	3,720	3,420	3,570
S98T000549		Lower half	4,700	3,100	3,900[QC:e]
S98T000546	228:4	Upper half	3,320	3,820	3,570
S98T000547		Lower half	6,990	6,240	6,610
S98T000577	228:5	Upper half	3,350	3,610	3,480
S98T000596		Lower half	4,430	3,960	4,200
S98T000608	228:6	Upper half	3,550	3,730	3,640
S98T000635		Lower half	4,090	4,090	4,090
S98T000636	228:7	Lower half	4,330	4,040	4,180
S98T000637	228:8	Upper half	4,380	3,400	3,890[QC:e]
S98T000638		Lower half	4,520	4,450	4,480

Table B2-60. Tank 241-AX-101 Analytical Results: Phosphate (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest (Cont'd)			**μg/g**	**μg/g**	**μg/g**
S98T000597	228:9	Upper half	3,850	4,660	4,260
S98T000598		Lower half	4,380	4,360	4,370
S98T000639	228:10	Lower half	6,230	6,550	6,390
S98T000776	228:11	Lower half	12,400	12,500	12,400
S98T000799	228:12	Lower half	8,500	7,810	8,150
S98T000800	228:13	Lower half	11,400	10,200	10,800
S98T000801	228:14	Lower half	8,880	9,640	9,260
S98T000802	228:15	Lower half	9,200	9,270	9,240
S98T000676	Core 226	Solid composite	7,350	7,540	7,450
S98T000999	Core 228	Solid composite	6,950	7,410	7,180
Liquids			**μg/mL**	**μg/mL**	**μg/mL**
S98T000090	226:1	Drainable liquid	39.5	39.1	39.3
S98T001009	226:8	Drainable liquid	3,300	2,590	2,940[QC:e]
S98T000295	226:11R	Drainable liquid	3,270	3,200	3,230
S98T000303	226:12	Drainable liquid	2,710	2,570	2,640
S98T000304	226:13	Drainable liquid	2,680	2,880	2,780
S98T000305	226:14	Drainable liquid	3,050	3,150	3,100
S98T000514	226:15	Drainable liquid	3,270	3,220	3,240
S98T000652	228:7	Drainable liquid	4,430	3,740	4,090
S98T000658	228:10	Drainable liquid	3,300	3,390	3,350
S98T000781	228:11	Drainable liquid	3,440	3,250	3,340
S98T000812	228:12	Drainable liquid	2,200	2,270	2,240
S98T000813	228:13	Drainable liquid	5,280	7,580	6,430[QC:e]
S98T000814	228:14	Drainable liquid	2,580	2,760	2,670
S98T000815	228:15	Drainable liquid	2,960	2,880	2,920

Table B2-61. Tank 241-AX-101 Analytical Results: Sulfate (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			µg/g	µg/g	µg/g
S98T000089	226:1	Lower half	5,600	6,080	5,840
S98T000096	226:2	Upper half	23,900	23,700	23,800
S98T000100		Lower half	21,600	18,600	20,100
S98T000133	226:3	Upper half	19,500	19,800	19,600
S98T000134		Lower half	15,700	16,200	16,000
S98T000135	226:4	Upper half	21,900	21,400	21,600
S98T000136		Lower half	25,900	25,600	25,700
S98T000137	226:5	Upper half	24,300	24,700	24,500
S98T000138		Lower half	20,100	21,700	20,900
S98T000163	226:6	Upper half	26,300	26,900	26,600
S98T000164		Lower half	24,400	24,300	24,400
S98T000165	226:7	Upper half	26,400	27,800	27,100
S98T000166		Lower half	27,400	27,200	27,300
S98T001006	226:8	Whole	10,900	11,700	11,300
S98T000230	226:9	Upper half	26,900	28,100	27,500
S98T000245		Lower half	27,000	28,300	27,700
S98T000282	226:10	Upper half	25,600	26,000	25,800
S98T000286		Lower half	20,300	18,800	19,600
S98T000283	226:11R	Upper half	1,880	2,710	2,290[QC:e]
S98T000287		Lower half	<1,120	<1,100	<1,110
S98T000284	226:12	Upper half	<1,050	<1,080	<1,060
S98T000288		Lower half	<1,170	<1,190	<1,180
S98T000289	226:13	Whole	<1,150	<1,140	<1,150
S98T000285	226:14	Upper half	1,240	1,080	1,160
S98T000290		Lower half	<1,110	<1,100	<1,100
S98T000511	226:15	Lower half	4,260	2,680	3,470[QC:e]
S98T000550	228:2	Upper half	24,000	27,900	26,000
S98T000551		Lower half	22,000	23,100	22,600
S98T000548	228:3	Upper half	25,600	22,200	23,900
S98T000549		Lower half	19,600	24,200	21,900[QC:e]

Table B2-61. Tank 241-AX-101 Analytical Results: Sulfate (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000546	228:4	Upper half	19,900	21,800	20,900
S98T000547		Lower half	18,000	18,600	18,300
S98T000577	228:5	Upper half	23,200	23,300	23,200
S98T000596		Lower half	22,800	23,500	23,200
S98T000608	228:6	Upper half	22,400	19,900	21,100
S98T000635		Lower half	22,200	22,400	22,300
S98T000636	228:7	Lower half	18,600	18,100	18,400
S98T000637	228:8	Upper half	27,100	23,900	25,500
S98T000638		Lower half	24,800	25,000	24,900
S98T000597	228:9	Upper half	27,000	31,200	29,100
S98T000598		Lower half	26,000	24,600	25,300
S98T000639	228:10	Lower half	1,190	<1,060	<1,130
S98T000776	228:11	Lower half	<1,020	<1,070	<1,040
S98T000799	228:12	Lower half	<1,060	<1,060	<1,060
S98T000800	228:13	Lower half	<1,130	<1,110	<1,120
S98T000801	228:14	Lower half	<1,160	<1,140	<1,150
S98T000802	228:15	Lower half	1,170	<1,100	<1,140
S98T000676	Core 226	Solid composite	22,500	20,900	21,700
S98T000999	Core 228	Solid composite	15,900	14,900	15,400
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	51	51.6	51.3
S98T001009	226:8	Drainable liquid	19,500	19,500	19,500
S98T000295	226:11R	Drainable liquid	1,970	1,930	1,950
S98T000303	226:12	Drainable liquid	<1,410	<1,410	<1,410
S98T000304	226:13	Drainable liquid	1,840	1,810	1,830
S98T000305	226:14	Drainable liquid	1,620	1,630	1,620
S98T000514	226:15	Drainable liquid	2,040	2,010	2,020
S98T000652	228:7	Drainable liquid	5,130	4,770	4,950
S98T000658	228:10	Drainable liquid	1,560	1,760	1,660
S98T000781	228:11	Drainable liquid	3,290	3,360	3,330

Table B2-61. Tank 241-AX-101 Analytical Results: Sulfate (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids (Cont'd)			**µg/mL**	**µg/mL**	**µg/mL**
S98T000812	228:12	Drainable liquid	1,870	1,700	1,790
S98T000813	228:13	Drainable liquid	4,300	5,930	5,120[QC:e]
S98T000814	228:14	Drainable liquid	1,710	1,830	1,770
S98T000815	228:15	Drainable liquid	1,600	1,690	1,640

Table B2-62. Tank 241-AX-101 Analytical Results: Oxalate (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S98T000089	226:1	Lower half	3,980	4,030	4,000
S98T000096	226:2	Upper half	7,350	7,450	7,400
S98T000100		Lower half	6,410	5,940	6,170
S98T000133	226:3	Upper half	7,430	8,410	7,920
S98T000134		Lower half	5,210	5,190	5,200
S98T000135	226:4	Upper half	8,340	7,770	8,060
S98T000136		Lower half	10,900	9,220	10,000
S98T000137	226:5	Upper half	9,130	10,400	9,760
S98T000138		Lower half	8,350	8,600	8,470
S98T000163	226:6	Upper half	11,300	12,100	11,700
S98T000164		Lower half	9,020	9,040	9,030
S98T000165	226:7	Upper half	11,100	9,640	10,400
S98T000166		Lower half	14,800	11,300	13,000[QC:e]
S98T001006	226:8	Whole	56,300	56,300	56,300
S98T000230	226:9	Upper half	9,850	11,600	10,700
S98T000245		Lower half	12,200	11,100	11,600
S98T000282	226:10	Upper half	10,700	12,800	11,700
S98T000286		Lower half	20,500	12,500	16,500[QC:e]
S98T000283	226:11R	Upper half	1,270	1,230	1,250
S98T000287		Lower half	<855	<835	<845

Table B2-62. Tank 241-AX-101 Analytical Results: Oxalate (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest (Cont'd)			**µg/g**	**µg/g**	**µg/g**
S98T000284	226:12	Upper half	<798	<825	<812
S98T000288		Lower half	<893	<906	<900
S98T000289	226:13	Whole	<876	<864	<870
S98T000285	226:14	Upper half	12,900	14,100	13,500
S98T000290		Lower half	17,400	16,800	17,100
S98T000511	226:15	Lower half	16,200	14,300	15,200
S98T000550	228:2	Upper half	6,490	7,380	6,940
S98T000551		Lower half	6,360	6,740	6,550
S98T000548	228:3	Upper half	7,800	9,170	8,480
S98T000549		Lower half	7,280	8,360	7,820
S98T000546	228:4	Upper half	7,660	8,300	7,980
S98T000547		Lower half	8,300	7,780	8,040
S98T000577	228:5	Upper half	8,490	12,300	10,400[QC:e]
S98T000596		Lower half	8,810	10,200	9,500
S98T000608	228:6	Upper half	8,540	7,800	8,170
S98T000635		Lower half	8,580	8,140	8,360
S98T000636	228:7	Lower half	6,940	6,730	6,840
S98T000637	228:8	Upper half	13,300	11,300	12,300
S98T000638		Lower half	14,100	14,700	14,400
S98T000597	228:9	Upper half	16,500	22,200	19,400[QC:e]
S98T000598		Lower half	25,100	18,000	21,500[QC:e]
S98T000639	228:10	Lower half	5,660	5,500	5,580
S98T000776	228:11	Lower half	<774	<812	<793
S98T000799	228:12	Lower half	<806	<806	<806
S98T000800	228:13	Lower half	<862	<847	<854
S98T000801	228:14	Lower half	3,400	3,190	3,300
S98T000802	228:15	Lower half	2,160	2,100	2,130
S98T000676	Core 226	Solid composite	12,700	12,600	12,600
S98T000999	Core 228	Solid composite	8,280	7,740	8,010

Table B2-62. Tank 241-AX-101 Analytical Results: Oxalate (IC). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	<10.6	<10.6	<10.6
S98T001009	226:8	Drainable liquid	<1,070	1,010	<1,040
S98T000295	226:11R	Drainable liquid	<1,070	<1,070	<1,070
S98T000303	226:12	Drainable liquid	<1,070	<1,070	<1,070
S98T000304	226:13	Drainable liquid	<541	<541	<541
S98T000305	226:14	Drainable liquid	643	<541	<592
S98T000514	226:15	Drainable liquid	<541	<541	<541
S98T000652	228:7	Drainable liquid	<1,070	<1,070	<1,070
S98T000658	228:10	Drainable liquid	<1,070	<1,070	<1,070
S98T000781	228:11	Drainable liquid	1,720	1,720	1,720
S98T000812	228:12	Drainable liquid	834	675	754[QC:e]
S98T000813	228:13	Drainable liquid	1,740	1,240	1,490[QC:e]
S98T000814	228:14	Drainable liquid	<541	<541	<541
S98T000815	228:15	Drainable liquid	893	<541	<717[QC:e]

Table B2-63. Tank 241-AX-101 Analytical Results: Bulk Density. (2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids			**g/mL**	**g/mL**	**g/mL**
S98T000083	226:1	Whole	1.78	n/a	1.78
S98T000092	226:2	Lower half	1.62	n/a	1.62
S98T000104	226:3	Lower half	1.75	n/a	1.75
S98T000112	226:4	Lower half	1.68	n/a	1.68
S98T000114	226:5	Lower half	1.67	n/a	1.67
S98T000144	226:6	Lower half	1.66	n/a	1.66
S98T000146	226:7	Lower half	1.62	n/a	1.62
S98T000226	226:9	Lower half	1.81	n/a	1.81
S98T000236	226:10	Lower half	1.8	n/a	1.8
S98T000237	226:11R	Lower half	1.58	n/a	1.58

Table B2-63. Tank 241-AX-101 Analytical Results: Bulk Density. (2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids (Cont'd)			g/mL	g/mL	g/mL
S98T000238	226:12	Lower half	1.64	n/a	1.64
S98T000239	226:13	Whole	1.61	n/a	1.61
S98T000240	226:14	Lower half	1.97	n/a	1.97
S98T000506	226:15	Lower half	1.74	n/a	1.74
S98T000521	228:2	Lower half	1.67	n/a	1.67
S98T000519	228:3	Lower half	1.71	n/a	1.71
S98T000517	228:4	Lower half	1.66	n/a	1.66
S98T000578	228:5	Lower half	1.73	n/a	1.73
S98T000609	228:6	Lower half	1.64	n/a	1.64
S98T000610	228:7	Lower half	1.76	n/a	1.76
S98T000612	228:8	Lower half	1.55	n/a	1.55
S98T000580	228:9	Lower half	1.61	n/a	1.61
S98T000613	228:10	Lower half	1.64	n/a	1.64
S98T000767	228:11	Lower half	1.65	n/a	1.65
S98T000783	228:12	Lower half	1.71	n/a	1.71
S98T000784	228:13	Lower half	1.48	n/a	1.48
S98T000785	228:14	Lower half	1.38	n/a	1.38
S98T000786	228:15	Lower half	1.66	n/a	1.66
S98T000664	Core 226	Solid composite	1.68	n/a	1.68
S98T000994	Core 228	Solid composite	1.67	n/a	1.67

Table B2-64. Tank 241-AX-101 Analytical Results: Exotherm (DSC). (2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids			**J/g**	**J/g**	**J/g**
S98T000106	226:3	Lower half	54.9	64.1	59.5
S98T000107	226:4	Upper half	70.2	64.3	67.2
S98T000108		Lower half	96.9	79.7	88.3
S98T000109	226:5	Upper half	57.5	63.2	60.3
S98T000110		Lower half	71.2	80.7	75.9
S98T000147	226:6	Upper half	81.7	58.9	70.3[QC:e]
S98T000148		Lower half	70.9	86.5	78.7
S98T000149	226:7	Upper half	70.4	79.8	75.1
S98T000150		Lower half	184	151	168
S98T001002	226:8	Whole	26.3	17.6	21.9[QC:e]
S98T000227	226:9	Upper half	68.1	68.5	68.3
S98T000242		Lower half	143	154	149
S98T000246	226:10	Upper half	76	155	115[QC:e]
S98T000250		Lower half	9.87	0	4.9
S98T000247	226:11R	Upper half	18.1	18.5	18.3
S98T000251		Lower half	13.1	13.9	13.5
S98T000248	226:12	Upper half	45.5	41.1	43.3
S98T000252		Lower half	75.4	72	73.7
S98T000254	226:14	Lower half	55.5	81	68.2[QC:e]
S98T000507	226:15	Lower half	10.3	10.4	10.4
S98T000527	228:2	Lower half	172	123	147[QC:e]
S98T000524	228:3	Upper half	48.5	51.9	50.2
S98T000522	228:4	Upper half	41.6	43.1	42.3
S98T000523		Lower half	71.4	64.1	67.8
S98T000573	228:5	Upper half	79.2	102	90.5
S98T000581		Lower half	59.1	52.4	55.7
S98T000604	228:6	Upper half	57.8	49	53.4
S98T000620		Lower half	47.3	57.4	52.3
S98T000621	228:7	Lower half	46.6	44.7	45.7

Table B2-64. Tank 241-AX-101 Analytical Results: Exotherm (DSC). (2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids (Cont'd)			**J/g**	**J/g**	**J/g**
S98T000622	228:8	Upper half	72.5	53.2	62.9[QC:e]
S98T000623		Lower half	70.4	74.2	72.3
S98T000582	228:9	Upper half	64.8	75.4	70.1
S98T000583		Lower half	55.1	80.6	67.8[QC:e]
S98T000624	228:10	Lower half	13.3	11.4	12.3
S98T000768	228:11	Lower half	30.5	31.4	31
S98T000787	228:12	Lower half	15.1	15.2	15.2
S98T000788	228:13	Lower half	18.5	18.9	18.7
S98T000789	228:14	Lower half	18.6	17.2	17.9
S98T000790	228:15	Lower half	16	15	15.5
Liquids			**J/g**	**J/g**	**J/g**
S98T000294	226:11R	Drainable liquid	96.4	97.4	96.9
S98T000300	226:12	Drainable liquid	23.8	27	25.4
S98T000301	226:13	Drainable liquid	71.5	71.7	71.6
S98T000302	226:14	Drainable liquid	70.1	70.3	70.2
S98T000514	226:15	Drainable liquid	207	264	235[QC:e]
S98T000652	228:7	Drainable liquid	93.4	96.5	95
S98T000659	228:10	Drainable liquid	77.2	77.8	77.5
S98T000780	228:11	Drainable liquid	87.1	98.2	92.7
S98T000808	228:12	Drainable liquid	19.8	19.6	19.7
S98T000809	228:13	Drainable liquid	5.44	5.16	5.3
S98T000810	228:14	Drainable liquid	30.3	28.2	29.2
S98T000811	228:15	Drainable liquid	30.1	30.4	30.2

Table B2-65. Tank 241-AX-101 Analytical Results: Percent Water (TGA). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids			**%**	**%**	**%**
S98T000085	226:1	Lower half	32.2	36.7	34.5
S98T000093	226:2	Upper half	36.4	38.8	37.6
S98T000097		Lower half	35.3	36.4	35.8
S98T000105	226:3	Upper half	43.2	34.5	38.9
S98T000106		Lower half	33.5	33.7	33.6
S98T000107	226:4	Upper half	36.7	34	35.4
S98T000108		Lower half	35.7	25	30.4[QC:e]
S98T000109	226:5	Upper half	40.3	39.8	40
S98T000110		Lower half	31.9	34.1	33
S98T000147	226:6	Upper half	35	35.3	35.1
S98T000148		Lower half	35.2	34.7	35
S98T000149	226:7	Upper half	36.1	35.7	35.9
S98T000150		Lower half	35.2	34.6	34.9
S98T001002	226:8	Whole	58.7	55.4	57
S98T000227	226:9	Upper half	33.8	35	34.4
S98T000242		Lower half	37.8	39	38.4
S98T000246	226:10	Upper half	38.5	38.5	38.5
S98T000250		Lower half	40.4	37.6	39
S98T000247	226:11R	Upper half	41.9	41.1	41.5
S98T000251		Lower half	42.4	31.8	37.1
S98T000248	226:12	Upper half	37.8	40.8	39.3
S98T000252		Lower half	43.4	43	43.2
S98T000253	226:13	Whole	30.2	37.6	33.9
S98T000249	226:14	Upper half	19.4	20.2	19.8
S98T000254		Lower half	22.1	25.3	23.7
S98T000507	226:15	Lower half	29.4	29.6	29.5
S98T000526	228:2	Upper half	34.3	34.4	34.4
S98T000527		Lower half	32.5	33.5	33
S98T000524	228:3	Upper half	25.2	36	30.6[QC:e]
S98T000525		Lower half	32.3	24.5	28.4

Table B2-65. Tank 241-AX-101 Analytical Results: Percent Water (TGA). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids (Cont'd)			%	%	%
S98T000522	228:4	Upper half	36.6	34.8	35.7
S98T000523		Lower half	38	34.1	36
S98T000573	228:5	Upper half	30.7	29.9	30.3
S98T000581		Lower half	32.4	37.7	35
S98T000604	228:6	Upper half	35.9	37.1	36.5
S98T000620		Lower half	33.2	33.2	33.2
S98T000621	228:7	Lower half	39.1	38.4	38.8
S98T000622	228:8	Upper half	35.3	29.3	32.3
S98T000623		Lower half	34.6	34.5	34.5
S98T000582	228:9	Upper half	30.8	37.1	34
S98T000583		Lower half	36.1	32.7	34.4
S98T000624	228:10	Lower half	26.9	30	28.5
S98T000768	228:11	Lower half	31.9	27.8	29.8
S98T000787	228:12	Lower half	46.2	46.1	46.2
S98T000788	228:13	Lower half	45.6	46.2	45.9
S98T000789	228:14	Lower half	46.2	46.4	46.3
S98T000790	228:15	Lower half	46.2	41.1	43.7
S98T000670	Core 226	Solid composite	27	22.4	24.7
S98T000995	Core 228	Solid composite	41	39.6	40.3
Liquids			%	%	%
S98T000090	226:1	Drainable liquid	52.9	53	53
S98T001008	226:8	Drainable liquid	63	63.7	63.3
S98T000294	226:11R	Drainable liquid	47.3	47.4	47.3
S98T000300	226:12	Drainable liquid	47.2	46.7	47
S98T000301	226:13	Drainable liquid	47.7	47.9	47.8
S98T000302	226:14	Drainable liquid	47.6	47.6	47.6
S98T000514	226:15	Drainable liquid	47.1	47.2	47.2
S98T000652	228:7	Drainable liquid	47.1	47.2	47.2
S98T000659	228:10	Drainable liquid	47	46.9	47
S98T000780	228:11	Drainable liquid	48.3	47.9	48.1

Table B2-65. Tank 241-AX-101 Analytical Results: Percent Water (TGA). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids (Cont'd)			**%**	**%**	**%**
S98T000808	228:12	Drainable liquid	47.9	48	47.9
S98T000809	228:13	Drainable liquid	47.5	47.8	47.6
S98T000810	228:14	Drainable liquid	48.4	48.3	48.3
S98T000811	228:15	Drainable liquid	48.1	48.1	48.1

Table B2-66. Tank 241-AX-101 Analytical Results: Specific Gravity.

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**unitless**	**unitless**	**unitless**
S98T000090	226:1	Drainable liquid	1.37	1.36	1.37
S98T001009	226:8	Drainable liquid	1.31	1.31	1.31
S98T000295	226:11R	Drainable liquid	1.5	1.5	1.5
S98T000303	226:12	Drainable liquid	1.49	1.48	1.48
S98T000304	226:13	Drainable liquid	1.5	1.49	1.49
S98T000305	226:14	Drainable liquid	1.48	1.48	1.48
S98T000514	226:15	Drainable liquid	1.48	1.48	1.48
S98T000652	228:7	Drainable liquid	1.56	1.57	1.57
S98T000658	228:10	Drainable liquid	1.48	1.45	1.46
S98T000781	228:11	Drainable liquid	1.45	1.44	1.45
S98T000812	228:12	Drainable liquid	1.45	1.43	1.44
S98T000813	228:13	Drainable liquid	1.45	1.46	1.45
S98T000814	228:14	Drainable liquid	1.44	1.45	1.45
S98T000815	228:15	Drainable liquid	1.55	1.56	1.55

Table B2-67. Tank 241-AX-101 Analytical Results: Total Alpha.

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**μCi/mL**	**μCi/mL**	**μCi/mL**
S98T000090	226:1	Drainable liquid	<0.0202	<0.012	<0.0161
S98T001008	226:8	Drainable liquid	<0.00305	<0.00305	<0.00305
S98T000294	226:11R	Drainable liquid	<0.00846	<0.00553	<0.007
S98T000300	226:12	Drainable liquid	<0.00553	<0.00412	<0.00483
S98T000301	226:13	Drainable liquid	<0.0564	<0.0768	<0.0666
S98T000302	226:14	Drainable liquid	<0.0495	<0.0768	<0.0632
S98T000514	226:15	Drainable liquid	<0.0145	<0.0145	<0.0145
S98T000659	228:10	Drainable liquid	<0.0174	<0.012	<0.0147
S98T000780	228:11	Drainable liquid	<0.012	<0.0145	<0.0133
S98T000808	228:12	Drainable liquid	<0.0174	<0.0174	<0.0174
S98T000809	228:13	Drainable liquid	<0.0122	<0.0122	<0.0122
S98T000810	228:14	Drainable liquid	<0.0122	<0.0177	<0.015
S98T000811	228:15	Drainable liquid	<0.0122	<0.0177	<0.015

Table B2-68. Tank 241-AX-101 Analytical Results: Total Alpha. (2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**μCi/g**	**μCi/g**	**μCi/g**
S98T000087	226:1	Lower half	0.0295	0.015	0.0223[QC:e]
S98T000098	226:2	Lower half	0.067	0.0562	0.0616
S98T000122	226:3	Lower half	0.0528	0.0406	0.0467[QC:c]
S98T000124	226:4	Lower half	0.0546	0.0637	0.0592
S98T000126	226:5	Lower half	0.0536	0.0577	0.0557[QC:c]
S98T000156	226:6	Lower half	0.0452	0.0533	0.0493
S98T000158	226:7	Lower half	0.0486	0.0376	0.0431[QC:e,f]
S98T001004	226:8	Whole	0.196	0.223	0.21
S98T000243	226:9	Lower half	0.0461	0.0564	0.0513[QC:e,f]
S98T000268	226:10	Lower half	0.0548	0.0444	0.0496[QC:e,f]
S98T000269	226:11R	Lower half	<0.00976	<0.00961	<0.00968

Table B2-68. Tank 241-AX-101 Analytical Results: Total Alpha. (2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion (Cont'd)			**µCi/g**	**µCi/g**	**µCi/g**
S98T000270	226:12	Lower half	<0.00881	<0.00871	<0.00876
S98T000271	226:13	Whole	<0.0102	<0.00991	<0.0101
S98T000272	226:14	Lower half	<0.005	<0.00476	<0.00488[QC:c]
S98T000509	226:15	Lower half	0.0103	<0.0127	<0.0115[QC:e]
S98T000539	228:2	Lower half	0.0987	0.0948	0.0968
S98T000537	228:3	Lower half	0.0924	0.0855	0.089
S98T000535	228:4	Lower half	0.0893	0.0752	0.0823
S98T000590	228:5	Lower half	0.0552	0.0605	0.0579
S98T000625	228:6	Lower half	0.0546	0.0683	0.0615[QC:e]
S98T000626	228:7	Lower half	0.0494	0.0533	0.0514
S98T000628	228:8	Lower half	0.0745	0.0856	0.0801
S98T000592	228:9	Lower half	0.0503	0.0473	0.0488
S98T000629	228:10	Lower half	<0.014	<0.0211	<0.0176[QC:c]
S98T000773	228:11	Lower half	<0.0213	<0.0221	<0.0217
S98T000791	228:12	Lower half	<0.0132	<0.00922	<0.0112
S98T000792	228:13	Lower half	0.00745	<0.00651	<0.00698
S98T000793	228:14	Lower half	0.0175	0.0244	0.021[QC:e,f]
S98T000794	228:15	Lower half	0.00817	0.0069	0.00754
S98T000674	Core 226	Solid composite	0.0579	0.0401	0.049[QC:e]
S98T000997	Core 228	Solid composite	0.0451	0.0444	0.0448

Table B2-69. Tank 241-AX-101 Analytical Results: Total Beta.

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			µCi/g	µCi/g	µCi/g
S98T000125	226:5	Upper half	258	251	255
S98T000126		Lower half	272	254	263
S98T000265	226:11R	Upper half	232	211	222
S98T000269		Lower half	250	277	264
S98T000272	226:14	Lower half	110	104	107
S98T000575	228:5	Upper half	248	282	265
S98T000590		Lower half	243	262	253
S98T000773	228:11	Lower half	181	180	181
S98T000793	228:14	Lower half	173	173	173
S98T000674	Core 226	Solid composite	181	182	182
S98T000997	Core 228	Solid composite	255	260	258

Table B2-70. Tank 241-AX-101 Analytical Results: Cesium-137 (GEA). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			µCi/g	µCi/g	µCi/g
S98T000087	226:1	Lower half	44.7	43.9	44.3
S98T000094	226:2	Upper half	174	205	189
S98T000098		Lower half	212	211	212
S98T000121	226:3	Upper half	171	191	181
S98T000122		Lower half	186	186	186
S98T000123	226:4	Upper half	196	193	195
S98T000124		Lower half	194	197	196
S98T000125	226:5	Upper half	198	195	196
S98T000126		Lower half	206	192	199
S98T000155	226:6	Upper half	186	197	192
S98T000156		Lower half	201	204	202
S98T000157	226:7	Upper half	204	236	220
S98T000158		Lower half	217	218	217

Table B2-70. Tank 241-AX-101 Analytical Results: Cesium-137 (GEA). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion (Cont'd)			**μCi/g**	**μCi/g**	**μCi/g**
S98T001004	226:8	Whole	112	107	110
S98T000228	226:9	Upper half	203	203	203
S98T000243		Lower half	191	200	195
S98T000264	226:10	Upper half	200	204	202
S98T000268		Lower half	225	225	225
S98T000265	226:11R	Upper half	219	205	212
S98T000269		Lower half	249	280	264
S98T000266	226:12	Upper half	185	200	193
S98T000270		Lower half	234	260	247
S98T000271	226:13	Whole	226	261	244
S98T000267	226:14	Upper half	159	150	154
S98T000272		Lower half	113	109	111
S98T000509	226:15	Lower half	174	152	163
S98T000538	228:2	Upper half	382	379	381
S98T000539		Lower half	183	180	182
S98T000536	228:3	Upper half	390	395	393
S98T000537		Lower half	196	187	191
S98T000534	228:4	Upper half	161	175	168
S98T000535		Lower half	196	183	190
S98T000575	228:5	Upper half	185	209	197
S98T000590		Lower half	178	195	187
S98T000606	228:6	Upper half	184	184	184
S98T000625		Lower half	189	185	187
S98T000626	228:7	Lower half	181	204	193
S98T000627	228:8	Upper half	191	189	190
S98T000628		Lower half	204	192	198
S98T000591	228:9	Upper half	197	185	191
S98T000592		Lower half	223	226	225
S98T000629	228:10	Lower half	233	207	220
S98T000773	228:11	Lower half	168	160	164

Table B2-70. Tank 241-AX-101 Analytical Results: Cesium-137 (GEA). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion (Cont'd)			**µCi/g**	**µCi/g**	**µCi/g**
S98T000791	228:12	Lower half	187	193	190
S98T000792	228:13	Lower half	213	209	211
S98T000793	228:14	Lower half	152	159	156
S98T000794	228:15	Lower half	192	175	184
S98T000674	Core 226	Solid composite	120	120	120
S98T000997	Core 228	Solid composite	200	206	203

Table B2-71. Tank 241-AX-101 Analytical Results: Cobalt-60 (GEA). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µCi/g**	**µCi/g**	**µCi/g**
S98T000087	226:1	Lower half	<0.0877	<0.0904	<0.089
S98T000094	226:2	Upper half	<0.0343	<0.0461	<0.0402
S98T000098		Lower half	<0.0284	<0.0274	<0.0279
S98T000121	226:3	Upper half	<0.041	<0.0477	<0.0443
S98T000122		Lower half	<0.0948	<0.0861	<0.0905
S98T000123	226:4	Upper half	<0.044	<0.0386	<0.0413
S98T000124		Lower half	<0.0206	<0.0214	<0.021
S98T000125	226:5	Upper half	<0.0354	<0.0376	<0.0365
S98T000126		Lower half	<0.0206	<0.0183	<0.0194
S98T000155	226:6	Upper half	<0.0388	<0.0382	<0.0385
S98T000156		Lower half	<0.021	<0.0203	<0.0207
S98T000157	226:7	Upper half	<0.0362	<0.0402	<0.0382
S98T000158		Lower half	<0.118	<0.098	<0.108
S98T001004	226:8	Whole	<0.0633	0.0949	<0.0791
S98T000228	226:9	Upper half	<0.0199	<0.0186	<0.0193
S98T000243		Lower half	<0.1	<0.121	<0.111
S98T000264	226:10	Upper half	<0.0177	<0.0186	<0.0182
S98T000268		Lower half	<0.0952	<0.102	<0.0986

Table B2-71. Tank 241-AX-101 Analytical Results: Cobalt-60 (GEA). (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion (Cont'd)			**µCi/g**	**µCi/g**	**µCi/g**
S98T000265	226:11R	Upper half	<0.00845	<0.00684	<0.00764
S98T000269		Lower half	<0.0536	<0.0631	<0.0583
S98T000266	226:12	Upper half	<0.00909	<0.00787	<0.00848
S98T000270		Lower half	<0.0542	<0.0516	<0.0529
S98T000271	226:13	Whole	<0.0588	<0.051	<0.0549
S98T000267	226:14	Upper half	<0.0103	<0.0109	<0.0106
S98T000272		Lower half	<0.0292	<0.0292	<0.0292
S98T000509	226:15	Lower half	<0.0141	<0.0131	<0.0136
S98T000538	228:2	Upper half	<0.0527	<0.0408	<0.0467
S98T000539		Lower half	<0.0193	<0.018	<0.0187
S98T000536	228:3	Upper half	<0.0445	<0.0443	<0.0444
S98T000537		Lower half	<0.0476	<0.0413	<0.0445
S98T000534	228:4	Upper half	<0.0218	<0.0262	<0.024
S98T000535		Lower half	<0.0442	<0.0457	<0.045
S98T000575	228:5	Upper half	<0.0111	<0.0135	<0.0123
S98T000590		Lower half	<0.0129	0.019	<0.0159[QC:e]
S98T000606	228:6	Upper half	<0.0295	<0.0334	<0.0315
S98T000625		Lower half	<0.0574	<0.0572	<0.0573
S98T000626	228:7	Lower half	<0.0515	<0.0558	<0.0537
S98T000627	228:8	Upper half	<0.0562	<0.0599	<0.0581
S98T000628		Lower half	<0.0589	<0.0591	<0.059
S98T000591	228:9	Upper half	<0.0613	<0.0579	<0.0596
S98T000592		Lower half	0.0414	0.0499	0.0456
S98T000629	228:10	Lower half	<0.012	<0.0116	<0.0118
S98T000773	228:11	Lower half	<0.0123	<0.0135	<0.0129
S98T000791	228:12	Lower half	<0.00858	<0.00916	<0.00887
S98T000792	228:13	Lower half	<0.0175	<0.0192	<0.0184
S98T000793	228:14	Lower half	<0.0134	<0.0134	<0.0134
S98T000794	228:15	Lower half	<0.0182	<0.0218	<0.02
S98T000674	Core 226	Solid composite	<0.0207	<0.0201	<0.0204
S98T000997	Core 228	Solid composite	<0.0336	<0.0327	<0.0331

Table B2-72. Tank 241-AX-101 Analytical Results: Strontium-89/90.

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**μCi/g**	**μCi/g**	**μCi/g**
S98T000125	226:5	Upper half	35.3	33.7	34.5
S98T000126		Lower half	36.7	35.6	36.2
S98T000265	226:11R	Upper half	0.489	0.492	0.491[QC:f]
S98T000269		Lower half	0.246	0.269	0.258
S98T000272	226:14	Lower half	0.909	1	0.955
S98T000575	228:5	Upper half	31.8	35.2	33.5
S98T000590		Lower half	30.7	32.8	31.8
S98T000773	228:11	Lower half	0.135	0.134	0.135[QC:f]
S98T000793	228:14	Lower half	1.89	1.98	1.94
S98T000674	Core 226	Solid composite	32.1	32.8	32.5
S98T000997	Core 228	Solid composite	28.5	28.1	28.3

Table B2-73. Tank 241-AX-101 Analytical Results: Total Organic Carbon (Furnace Oxidation).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Triplicate	Mean
Liquids			**μg/mL**	**μg/mL**	**μg/mL**	**μg/mL**
S98T000304	226:13	Drainable liquid	3,680	3,750		3,720
S98T000305	226:14	Drainable liquid	3,030	4,070	4,010	3,700[QC:e]
S98T000514	226:15	Drainable liquid	3,830	3,180		3,510
S98T000652	228:7	Drainable liquid	3,380	3,320		3,350
S98T000781	228:11	Drainable liquid	3,100	3,270		3,190
Solids: water digest			**μg/g**	**μg/g**		**μg/g**
S98T000288	226:12	Lower half	2,170	1,970		2,070
S98T000551	228:2	Lower half	3,290	3,840		3,570

Table B2-74. Tank 241-AX-101 Analytical Results: Total Inorganic Carbon. (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Triplicate	Mean
Solids			**µg/g**	**µg/g**	**µg/g**	**µg/g**
S98T000085	226:1	Lower half	6,100	10,200	7,560	7,950[QC:d,e]
S98T000093	226:2	Upper half	19,100	18,700		18,900
S98T000097		Lower half	19,500	19,400		19,500
S98T000105	226:3	Upper half	7,770	14,000	14,700	12,200[QC:e]
S98T000106		Lower half	12,800	16,400	12,300	13,800[QC:e]
S98T000107	226:4	Upper half	20,200	19,200		19,700
S98T000108		Lower half	22,400	22,500		22,500
S98T000109	226:5	Upper half	17,400	18,000		17,700
S98T000110		Lower half	20,300	22,100		21,200[QC:d]
S98T000147	226:6	Upper half	19,100	19,400		19,300
S98T000148		Lower half	17,900	20,200		19,100
S98T000149	226:7	Upper half	20,800	17,300		19,100
S98T000150		Lower half	19,400	19,500		19,500
S98T001002	226:8	Whole	9,320	9,320	9,180	9,270
S98T000227	226:9	Upper half	17,100	17,200		17,200
S98T000242		Lower half	14,500	14,300		14,400
S98T000246	226:10	Upper half	15,300	16,400		15,900
S98T000250		Lower half	23,400	16,700	13,900	18,000[QC:c,e]
S98T000247	226:11R	Upper half	938	790	832	853
S98T000251		Lower half	813	887		850
S98T000248	226:12	Upper half	635	645		640
S98T000252		Lower half	616	666		641
S98T000253	226:13	Whole	1,050	1,040		1,050
S98T000249	226:14	Upper half	2,080	1,980		2,030
S98T000254		Lower half	4,500	4,510		4,510
S98T000507	226:15	Lower half	4,700	5,730	7,470	5,970
S98T000526	228:2	Upper half	23,000	24,700	20,300	22,700
S98T000527		Lower half	18,600	19,000		18,800

Table B2-74. Tank 241-AX-101 Analytical Results: Total Inorganic Carbon. (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Triplicate	Mean
Solids (Cont'd)			**µg/g**	**µg/g**	**µg/g**	**µg/g**
S98T000524	228:3	Upper half	22,900	21,100		22,000
S98T000525		Lower half	10,800	17,700	19,300	15,900[QC:e]
S98T000522	228:4	Upper half	15,100	17,400		16,300
S98T000523		Lower half	14,300	13,600		14,000
S98T000573	228:5	Upper half	17,700	18,400		18,100
S98T000581		Lower half	14,400	17,000		15,700
S98T000604	228:6	Upper half	20,600	17,100		18,900
S98T000620		Lower half	19,100	18,100		18,600
S98T000621	228:7	Lower half	10,200	12,300		11,300
S98T000622	228:8	Upper half	16,300	17,400		16,900
S98T000623		Lower half	15,400	15,800		15,600
S98T000582	228:9	Upper half	18,900	17,500		18,200
S98T000583		Lower half	14,800	16,300	16,700	15,900
S98T000624	228:10	Lower half	2,650	3,570	2,060	2,760[QC:e]
S98T000768	228:11	Lower half	746	659		703
S98T000787	228:12	Lower half	715	705		710
S98T000788	228:13	Lower half	618	676		647
S98T000789	228:14	Lower half	1,070	1,300	1,350	1,240
S98T000790	228:15	Lower half	818	969		894
S98T000670	Core 226	Solid composite	13,900	18,300	19,100	17,100[QC:e]
S98T000995	Core 228	Solid composite	12,000	11,500		11,800
Liquids			**µg/mL**	**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	8,450	8,220		8,340
S98T001009	226:8	Drainable liquid	13,300	14,500		13,900
S98T000295	226:11R	Drainable liquid	1,730	1,490		1,610
S98T000303	226:12	Drainable liquid	1,590	1,670		1,630
S98T000304	226:13	Drainable liquid	987	962		975
S98T000305	226:14	Drainable liquid	969	975		972
S98T000514	226:15	Drainable liquid	2,310	2,390		2,350

Table B2-74. Tank 241-AX-101 Analytical Results: Total Inorganic Carbon. (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Triplicate	Mean
Liquids (Cont'd)			**μg/mL**	**μg/mL**	**μg/mL**	**μg/mL**
S98T000652	228:7	Drainable liquid	2,220	1,600	2,430	2,080[QC:e]
S98T000658	228:10	Drainable liquid	2,210	2,340		2,280
S98T000781	228:11	Drainable liquid	1,830	1,640		1,740
S98T000812	228:12	Drainable liquid	1,800	2,110		1,960
S98T000813	228:13	Drainable liquid	1,520	1,520		1,520
S98T000814	228:14	Drainable liquid	1,550	1,750		1,650
S98T000815	228:15	Drainable liquid	1,700	1,710		1,710

Table B2-75. Tank 241-AX-101 Analytical Results: Total Organic Carbon. (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Triplicate	Mean
Solids			**μg/g**	**μg/g**	**μg/g**	**μg/g**
S98T000085	226:1	Lower half	1,470	1,820	1,830	1,710[QC:e]
S98T000093	226:2	Upper half	4,090	3,750		3,920
S98T000097		Lower half	4,370	5,210		4,790
S98T000105	226:3	Upper half	4,000	4,520	3,930	4,150
S98T000106		Lower half	3,120	3,310	<40	2,160
S98T000107	226:4	Upper half	4,740	4,610		4,680
S98T000108		Lower half	4,950	5,110		5,030
S98T000109	226:5	Upper half	4,240	4,870		4,560
S98T000110		Lower half	5,240	5,950		5,600
S98T000147	226:6	Upper half	5,110	5,610		5,360
S98T000148		Lower half	4,730	5,070		4,900
S98T000149	226:7	Upper half	5,100	4,550		4,830
S98T000150		Lower half	5,310	5,130		5,220
S98T001002	226:8	Whole	10,300	13,800	14,400	12,800[QC:e]
S98T000227	226:9	Upper half	4,720	4,710		4,720
S98T000242		Lower half	4,110	4,260		4,190

Table B2-75. Tank 241-AX-101 Analytical Results: Total Organic Carbon. (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Triplicate	Mean
Solids (Cont'd)			µg/g	µg/g	µg/g	µg/g
S98T000246	226:10	Upper half	4,940	5,530		5,240
S98T000250		Lower half	6,380	5,840	<40	4,090[QC:e]
S98T000247	226:11R	Upper half	1,730	1,420	1,530	1,560
S98T000251		Lower half	1,820	1,990		1,910
S98T000248	226:12	Upper half	1,470	1,480		1,480
S98T000252		Lower half	1,340	1,560		1,450
S98T000253	226:13	Whole	2,020	2,200		2,110
S98T000249	226:14	Upper half	4,120	3,390		3,760
S98T000254		Lower half	6,200	6,130		6,170
S98T000507	226:15	Lower half	4,670	70.2	4,420	3,050[QC:e]
S98T000526	228:2	Upper half	3,960	150	3,440	2,520[QC:e]
S98T000527		Lower half	2,820	3,830	3,760	3,470[QC:e]
S98T000524	228:3	Upper half	4,500	5,000		4,750
S98T000525		Lower half	3,700	4,570	3,820	4,030[QC:e]
S98T000522	228:4	Upper half	4,350	3,970		4,160
S98T000523		Lower half	4,170	3,740		3,960
S98T000573	228:5	Upper half	4,100	4,320		4,210
S98T000581		Lower half	3,450	4,150		3,800
S98T000604	228:6	Upper half	4,950	4,620		4,790
S98T000620		Lower half	5,010	4,600		4,810
S98T000621	228:7	Lower half	3,900	4,320		4,110
S98T000622	228:8	Upper half	3,910	4,370		4,140
S98T000623		Lower half	6,050	5,970		6,010
S98T000582	228:9	Upper half	6,040	7,020		6,530
S98T000583		Lower half	5,630	7,570	6,410	6,540[QC:e]
S98T000624	228:10	Lower half	3,710	3,530	<40	2,430
S98T000768	228:11	Lower half	1,460	1,330		1,400
S98T000787	228:12	Lower half	1,680	1,630		1,660
S98T000788	228:13	Lower half	1,420	1,510		1,470
S98T000789	228:14	Lower half	2,860	2,140	2,770	2,590[QC:e]

Table B2-75. Tank 241-AX-101 Analytical Results: Total Organic Carbon. (3 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Triplicate	Mean
Solids (Cont'd)			**µg/g**	**µg/g**	**µg/g**	**µg/g**
S98T000790	228:15	Lower half	2,790	2,740		2,770
S98T000670	Core 226	Solid composite	3,880	2,960	4,880	3,910[QC:e]
S98T000995	Core 228	Solid composite	4,340	4,110		4,230
Liquids			**µg/mL**	**µg/mL**	**µg/mL**	**µg/mL**
S98T000090	226:1	Drainable liquid	1,820	1,600		1,710
S98T001009	226:8	Drainable liquid	1,740	1,630		1,690
S98T000295	226:11R	Drainable liquid	4,060	3,410		3,740[QC:e]
S98T000303	226:12	Drainable liquid	3,970	3,540		3,760
S98T000304	226:13	Drainable liquid	2,420	2,350		2,390
S98T000305	226:14	Drainable liquid	2,360	2,340		2,350
S98T000514	226:15	Drainable liquid	4,530	4,630		4,580
S98T000652	228:7	Drainable liquid	<40	3,000	4,850	<2,630[QC:e]
S98T000658	228:10	Drainable liquid	4,420	4,810		4,620[QC:e]
S98T000781	228:11	Drainable liquid	4,080	4,040		4,060
S98T000812	228:12	Drainable liquid	4,130	4,840		4,490
S98T000813	228:13	Drainable liquid	3,840	3,640		3,740
S98T000814	228:14	Drainable liquid	3,580	3,820		3,700
S98T000815	228:15	Drainable liquid	3,920	3,820		3,870

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Table B2-76. Tank 241-AX-101 Analytical Results: Aluminum (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	44,900	41,100	43,000[QC:c]
S97T001897		Grab Sample	41,800	45,400	43,600
S97T001898		Grab Sample	47,300	49,200	48,300

Table B2-77. Tank 241-AX-101 Analytical Results: Antimony (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<36.1	<36.1	<36.1
S97T001897		Grab Sample	<36.1	<36.1	<36.1
S97T001898		Grab Sample	<36.1	<36.1	<36.1

Table B2-78. Tank 241-AX-101 Analytical Results: Arsenic (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<60.1	<60.1	<60.1
S97T001897		Grab Sample	<60.1	<60.1	<60.1
S97T001898		Grab Sample	<60.1	<60.1	<60.1

Table B2-79. Tank 241-AX-101 Analytical Results: Barium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<30.1	<30.1	<30.1
S97T001897		Grab Sample	<30.1	<30.1	<30.1
S97T001898		Grab Sample	<30.1	<30.1	<30.1

Table B2-80. Tank 241-AX-101 Analytical Results: Beryllium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<3	<3	<3
S97T001897		Grab Sample	<3	<3	<3
S97T001898		Grab Sample	<3	<3	<3

Table B2-81. Tank 241-AX-101 Analytical Results: Bismuth (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<60.1	<60.1	<60.1
S97T001897		Grab Sample	<60.1	<60.1	<60.1
S97T001898		Grab Sample	<60.1	<60.1	<60.1

Table B2-82. Tank 241-AX-101 Analytical Results: Boron (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	44.8	43	43.9
S97T001897		Grab Sample	42.7	46.6	44.7
S97T001898		Grab Sample	47.5	47.8	47.6

Table B2-83. Tank 241-AX-101 Analytical Results: Cadmium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<3	<3	<3
S97T001897		Grab Sample	<3	<3	<3
S97T001898		Grab Sample	<3	<3	<3

Table B2-84. Tank 241-AX-101 Analytical Results: Calcium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			μg/mL	μg/mL	μg/mL
S97T001896	Riser 5B	Grab Sample	<60.1	<60.1	<60.1
S97T001897		Grab Sample	<60.1	<60.1	<60.1
S97T001898		Grab Sample	<60.1	<60.1	<60.1

Table B2-85. Tank 241-AX-101 Analytical Results: Cerium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			μg/mL	μg/mL	μg/mL
S97T001896	Riser 5B	Grab Sample	<60.1	<60.1	<60.1
S97T001897		Grab Sample	<60.1	<60.1	<60.1
S97T001898		Grab Sample	<60.1	<60.1	<60.1

Table B2-86. Tank 241-AX-101 Analytical Results: Chromium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			μg/mL	μg/mL	μg/mL
S97T001896	Riser 5B	Grab Sample	87.9	83.4	85.7
S97T001897		Grab Sample	80.4	88.2	84.3
S97T001898		Grab Sample	80.2	83.5	81.8

Table B2-87. Tank 241-AX-101 Analytical Results: Cobalt (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			μg/mL	μg/mL	μg/mL
S97T001896	Riser 5B	Grab Sample	<12	<12	<12
S97T001897		Grab Sample	<12	<12	<12
S97T001898		Grab Sample	<12	<12	<12

Table B2-88. Tank 241-AX-101 Analytical Results: Copper (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<6.01	<6.01	<6.01
S97T001897		Grab Sample	<6.01	<6.01	<6.01
S97T001898		Grab Sample	<6.01	<6.01	<6.01

Table B2-89. Tank 241-AX-101 Analytical Results: Iron (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<30.1	<30.1	<30.1
S97T001897		Grab Sample	<30.1	<30.1	<30.1
S97T001898		Grab Sample	<30.1	<30.1	<30.1

Table B2-90. Tank 241-AX-101 Analytical Results: Lanthanum (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<30.1	<30.1	<30.1
S97T001897		Grab Sample	<30.1	<30.1	<30.1
S97T001898		Grab Sample	<30.1	<30.1	<30.1

Table B2-91. Tank 241-AX-101 Analytical Results: Lead (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	126	115	121
S97T001897		Grab Sample	112	131	122
S97T001898		Grab Sample	142	136	139

Table B2-92. Tank 241-AX-101 Analytical Results: Lithium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			µg/mL	µg/mL	µg/mL
S97T001896	Riser 5B	Grab Sample	<6.01	<6.01	<6.01
S97T001897		Grab Sample	<6.01	<6.01	<6.01
S97T001898		Grab Sample	<6.01	<6.01	<6.01

Table B2-93. Tank 241-AX-101 Analytical Results: Magnesium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			µg/mL	µg/mL	µg/mL
S97T001896	Riser 5B	Grab Sample	<60.1	<60.1	<60.1
S97T001897		Grab Sample	<60.1	<60.1	<60.1
S97T001898		Grab Sample	<60.1	<60.1	<60.1

Table B2-94. Tank 241-AX-101 Analytical Results: Manganese (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			µg/mL	µg/mL	µg/mL
S97T001896	Riser 5B	Grab Sample	<6.01	<6.01	<6.01
S97T001897		Grab Sample	<6.01	<6.01	<6.01
S97T001898		Grab Sample	<6.01	<6.01	<6.01

Table B2-95. Tank 241-AX-101 Analytical Results: Molybdenum (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			µg/mL	µg/mL	µg/mL
S97T001896	Riser 5B	Grab Sample	126	115	121
S97T001897		Grab Sample	117	128	123
S97T001898		Grab Sample	133	134	134

Table B2-96. Tank 241-AX-101 Analytical Results: Neodymium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<60.1	<60.1	<60.1
S97T001897		Grab Sample	<60.1	<60.1	<60.1
S97T001898		Grab Sample	<60.1	<60.1	<60.1

Table B2-97. Tank 241-AX-101 Analytical Results: Nickel (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<12	<12	<12
S97T001897		Grab Sample	<12	<12	<12
S97T001898		Grab Sample	<12	<12	<12

Table B2-98. Tank 241-AX-101 Analytical Results: Phosphorus (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	1,040	981	1,010
S97T001897		Grab Sample	964	1,010	987
S97T001898		Grab Sample	1,030	1,080	1,060

Table B2-99. Tank 241-AX-101 Analytical Results: Potassium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	7,250	6,840	7,050[QC:c]
S97T001897		Grab Sample	7,120	7,480	7,300
S97T001898		Grab Sample	7,720	7,840	7,780

Table B2-100. Tank 241-AX-101 Analytical Results: Samarium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<60.1	<60.1	<60.1
S97T001897		Grab Sample	<60.1	<60.1	<60.1
S97T001898		Grab Sample	<60.1	<60.1	<60.1

Table B2-101. Tank 241-AX-101 Analytical Results: Selenium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<60.1	<60.1	<60.1
S97T001897		Grab Sample	<60.1	<60.1	<60.1
S97T001898		Grab Sample	<60.1	<60.1	<60.1

Table B2-102. Tank 241-AX-101 Analytical Results: Silicon (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	45.3	47.5	46.4
S97T001897		Grab Sample	42.1	45.7	43.9
S97T001898		Grab Sample	40.6	41.2	40.9

Table B2-103. Tank 241-AX-101 Analytical Results: Silver (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	18.1	17.3	17.7
S97T001897		Grab Sample	17	17.6	17.3
S97T001898		Grab Sample	17.2	18.3	17.8

Table B2-104. Tank 241-AX-101 Analytical Results: Sodium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	2.53E+05	2.38E+05	2.46E+05[QC:c]
S97T001897		Grab Sample	2.39E+05	2.51E+05	2.45E+05
S97T001898		Grab Sample	2.49E+05	2.53E+05	2.51E+05

Table B2-105. Tank 241-AX-101 Analytical Results: Strontium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<6.01	<6.01	<6.01
S97T001897		Grab Sample	<6.01	<6.01	<6.01
S97T001898		Grab Sample	<6.01	<6.01	<6.01

Table B2-106. Tank 241-AX-101 Analytical Results: Sulfur (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	916	737	827[QC:e]
S97T001897		Grab Sample	417	409	413
S97T001898		Grab Sample	378	406	392

Table B2-107. Tank 241-AX-101 Analytical Results: Thallium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<120	<120	<120
S97T001897		Grab Sample	<120	<120	<120
S97T001898		Grab Sample	<120	<120	<120

Table B2-108. Tank 241-AX-101 Analytical Results: Titanium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<6.01	<6.01	<6.01
S97T001897		Grab Sample	<6.01	<6.01	<6.01
S97T001898		Grab Sample	<6.01	<6.01	<6.01

Table B2-109. Tank 241-AX-101 Analytical Results: Total Uranium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<300	<300	<300
S97T001897		Grab Sample	<300	<300	<300
S97T001898		Grab Sample	<300	<300	<300

Table B2-110. Tank 241-AX-101 Analytical Results: Vanadium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<30.1	<30.1	<30.1
S97T001897		Grab Sample	<30.1	<30.1	<30.1
S97T001898		Grab Sample	<30.1	<30.1	<30.1

Table B2-111. Tank 241-AX-101 Analytical Results: Zinc (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<6.01	<6.01	<6.01
S97T001897		Grab Sample	11.5	12.5	12
S97T001898		Grab Sample	<6.01	<6.01	<6.01

Table B2-112. Tank 241-AX-101 Analytical Results: Zirconium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<6.01	<6.01	<6.01
S97T001897		Grab Sample	<6.01	<6.01	<6.01
S97T001898		Grab Sample	<6.01	<6.01	<6.01

Table B2-113. Tank 241-AX-101 Analytical Results: Total Uranium (Kinetic Phosphorescence.)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001899	Riser 5B	Grab Sample	0.965	0.941	0.953[QC:f]
S97T001900		Grab Sample	0.9	0.82	0.86[QC:f]
S97T001901		Grab Sample	0.809	0.831	0.82[QC:f]

Table B2-114. Tank 241-AX-101 Analytical Results: Bromide (IC).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<518	<518	<518
S97T001897		Grab Sample	<644	<644	<644
S97T001898		Grab Sample	<644	<644	<644

Table B2-115. Tank 241-AX-101 Analytical Results: Chloride (IC).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	7,660	7,660	7,660
S97T001897		Grab Sample	7,120	6,960	7,040
S97T001898		Grab Sample	7,890	7,900	7,890

Table B2-116. Tank 241-AX-101 Analytical Results: Fluoride (IC).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			µg/mL	µg/mL	µg/mL
S97T001896	Riser 5B	Grab Sample	<49.7	<49.7	<49.7[QC:c]
S97T001897		Grab Sample	<61.8	<61.8	<61.8
S97T001898		Grab Sample	<61.8	<61.8	<61.8

Table B2-117. Tank 241-AX-101 Analytical Results: Nitrate (IC).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			µg/mL	µg/mL	µg/mL
S97T001896	Riser 5B	Grab Sample	1.86E+05	1.86E+05	1.86E+05
S97T001897		Grab Sample	1.46E+05	1.45E+05	1.45E+05
S97T001898		Grab Sample	1.40E+05	1.40E+05	1.40E+05

Table B2-118. Tank 241-AX-101 Analytical Results: Nitrite (IC).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			µg/mL	µg/mL	µg/mL
S97T001896	Riser 5B	Grab Sample	1.54E+05	1.56E+05	1.55E+05
S97T001897		Grab Sample	1.49E+05	1.50E+05	1.50E+05
S97T001898		Grab Sample	1.62E+05	1.63E+05	1.63E+05

Table B2-119. Tank 241-AX-101 Analytical Results: Phosphate (IC).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			µg/mL	µg/mL	µg/mL
S97T001896	Riser 5B	Grab Sample	6,580	6,610	6,590
S97T001897		Grab Sample	2,800	2,890	2,850
S97T001898		Grab Sample	3,050	3,040	3,050

Table B2-120. Tank 241-AX-101 Analytical Results: Sulfate (IC).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	2,920	3,250	3,080
S97T001897		Grab Sample	814	828	821
S97T001898		Grab Sample	<711	<711	<711

Table B2-121. Tank 241-AX-101 Analytical Results: Oxalate (IC).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	<435	<435	<435
S97T001897		Grab Sample	<541	<541	<541
S97T001898		Grab Sample	<541	<541	<541

Table B2-122. Tank 241-AX-101 Analytical Results: Exotherm (DSC).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**J/g**	**J/g**	**J/g**
S97T001896	Riser 5B	Grab Sample	38.3	38.6	38.5
S97T001897		Grab Sample	21.9	34.2	28.1[QC:e]

Table B2-123. Tank 241-AX-101 Analytical Results: Percent Water (TGA).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**%**	**%**	**%**
S97T001896	Riser 5B	Grab Sample	48.1	48.6	48.4
S97T001897		Grab Sample	47.6	47.8	47.7
S97T001898		Grab Sample	46.8	46.9	46.8

Table B2-124. Tank 241-AX-101 Analytical Results: PH Measurement.

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**unitless**	**unitless**	**unitless**
S97T001896	Riser 5B	Grab Sample	13.3	13.4	13.4
S97T001897		Grab Sample	12.3	12.3	12.3
S97T001898		Grab Sample	13.2	13.2	13.2

Table B2-125. Tank 241-AX-101 Analytical Results: Specific Gravity.

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**unitless**	**unitless**	**unitless**
S97T001896	Riser 5B	Grab Sample	1.34	1.41	1.38
S97T001897		Grab Sample	1.41	1.39	1.4
S97T001898		Grab Sample	1.4	1.46	1.43

Table B2-126. Tank 241-AX-101 Analytical Results: Americium-241.

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**μCi/mL**	**μCi/mL**	**μCi/mL**
S97T001899	Riser 5B	Grab Sample	<3.36E-04	<3.15E-04	<3.26E-04
S97T001900		Grab Sample	<2.51E-04	<3.17E-04	<2.84E-04
S97T001901		Grab Sample	<4.88E-04	<6.66E-04	<5.77E-04

Table B2-127. Tank 241-AX-101 Analytical Results: Cesium-137 (GEA).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**μCi/mL**	**μCi/mL**	**μCi/mL**
S97T001899	Riser 5B	Grab Sample	378	391	385
S97T001900		Grab Sample	373	367	370
S97T001901		Grab Sample	429	430	430

Table B2-128. Tank 241-AX-101 Analytical Results: Cobalt-60 (GEA).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			µCi/mL	µCi/mL	µCi/mL
S97T001899	Riser 5B	Grab Sample	<0.017	<0.0162	<0.0166
S97T001900		Grab Sample	<0.0174	<0.015	<0.0162
S97T001901		Grab Sample	<0.0185	<0.0149	<0.0167

Table B2-129. Tank 241-AX-101 Analytical Results: Plutonium-239/240.

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			µCi/mL	µCi/mL	µCi/mL
S97T001899	Riser 5B	Grab Sample	<1.66E-04	<1.80E-04	<1.73E-04
S97T001900		Grab Sample	<2.58E-04	<2.11E-04	<2.35E-04
S97T001901		Grab Sample	<4.06E-04	<4.16E-04	<4.11E-04

Table B2-130. Tank 241-AX-101 Analytical Results: Strontium-89/90.

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			µCi/mL	µCi/mL	µCi/mL
S97T001899	Riser 5B	Grab Sample	0.304	0.317	0.311
S97T001900		Grab Sample	0.263	0.216	0.24
S97T001901		Grab Sample	0.228	0.261	0.245

Table B2-131. Tank 241-AX-101 Analytical Results: Total Organic Carbon (Furnace Oxidation)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			µg/mL	µg/mL	µg/mL
S97T001896	Riser 5B	Grab Sample	3,640	3,530	3,590
S97T001897		Grab Sample	3,910	3,870	3,890
S97T001898		Grab Sample	4,150	4,220	4,190

Table B2-132. Tank 241-AX-101 Analytical Results: Ammonia (Ion Selective Electrode).[1]

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001899	Riser 5B	Grab Sample	1,460	1,550	1,510
S97T001900		Grab Sample	1,730	1,810	1,770
S97T001901		Grab Sample	1,790	1,970	1,880

Note:

[1]Non-acidified samples

Table B2-133. Tank 241-AX-101 Analytical Results: Ammonia (Ion Selective Electrode)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids: acid digest			**µg/mL**	**µg/mL**	**µg/mL**
S97T001902[1]	Riser 5B	Grab Sample	<23.2	<23.2	<23.2
S97T001903[1]		Grab Sample	<22.8	<22.8	<22.8
S97T001904[1]		Grab Sample	<23.8	<23.8	<23.8
S97T001968[2]		Grab Sample	1,670	2,020	1,850
S97T001969[2]		Grab Sample	1,330	917	1,120
S97T001970[2]		Grab Sample	1,500	1,360	1,430

Notes:

[1]Acidified with concentrated HCl

[2]Acidified with 1*M* HCl

Table B2-134. Tank 241-AX-101 Analytical Results: Hydroxide (OH Direct).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001896	Riser 5B	Grab Sample	36,300	35,200	35,800
S97T001897		Grab Sample	40,900	36,700	38,800
S97T001898		Grab Sample	42,200	42,400	42,300

Table B2-135. Tank 241-AX-101 Analytical Results: Total Inorganic Carbon.

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			μg/mL	μg/mL	μg/mL
S97T001896	Riser 5B	Grab Sample	2,840	3,030	2,940
S97T001897		Grab Sample	2,340	2,400	2,370
S97T001898		Grab Sample	1,950	1,780	1,870

Table B2-136. Tank 241-AX-101 Analytical Results: Total Organic Carbon.

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			μg/mL	μg/mL	μg/mL
S97T001896	Riser 5B	Grab Sample	4,240	3,850	4,050[QC:d]
S97T001897		Grab Sample	3,730	3,620	3,680
S97T001898		Grab Sample	3,790	4,530	4,160

B3.0 ASSESSMENT OF CHARACTERIZATION RESULTS

This section discusses the overall quality and consistency of the 1998 core sampling results for tank 241-AX-101 and provides the results of an analytical-based inventory calculation.

This section also evaluates sampling and analysis factors that may impact data interpretation. These factors are used to assess overall data quality and consistency and to identify limitations in data use.

B3.1 FIELD OBSERVATIONS

Sample recovery was good for the 1998 core sample event. A hard layer was reached at segment 15 for both cores. A 5.1 cm (2 in.) stroke length resulted in recovering 5.1 cm (2 in.) of material from core 226, segment 15. In core 228, segment 15, about 12.7 cm (5 in.) of sample was recovered even though the stroke was terminated with "zero" stroke length. As the sampler was pulled from the tube it apparently siphoned waste. The X-ray also showed a full sampler. Based on process knowledge (Agnew et al. 1997), it is expected that the hard layer is a sludge heel. Little or no sludge was apparent in any sample.

Field X-rays showed the waste profile was similar to that of tank 241-A-101 in that a solid saltcake layer with gas voids lies above a liquid layer in the tank.

B3.2 QUALITY CONTROL ASSESSMENT

The usual QC assessment includes an evaluation of the appropriate standard recoveries, spike recoveries, duplicate analyses, and blanks that are performed in conjunction with the chemical analyses. All pertinent QC tests were conducted on 1998 core samples and 1997 grab samples, allowing a full assessment regarding the accuracy and precision of the data. (Field (1997) and Sasaki (1997) established specific criteria for all analytes. Sample and duplicate pairs with one or more QC results outside the specified criteria were identified by footnotes in the data summary tables.

The standard and spike recovery results provide an estimate of analysis accuracy. If a standard or spike recovery is above or below the given criterion, the analytical results may be biased high or low, respectively. The precision is estimated by the RPD, which is defined as the absolute value of the difference between the primary and duplicate samples, divided by their mean, times 100.

The RGS extraction process required that 300 mL of 0.2*M* ammonium hydroxide be added to the sample in the extractor. This may have caused a change in the composition of the solids for core 226, segment 8, and no bulk density was performed on this segment. The results from the IC analysis indicate a higher concentration of oxalate in this sample (S98T001002). The small exotherm at approximately 425 °C for this sample is typical for oxalate. Because the sample was treated in this way before DSC analysis, it is conceivable that the oxalate salts present in the solids are not homogeneous. Therefore, no reanalysis was requested.

Visual inhomogeneities were noted during the extrusion. Many of the QC findings noted in the data tables are attributed to sample in homogeneity. Except as discussed in this section, QC flags were considered insignificant, and no reanalysis was requested. Contamination was detected in the sample blank for manyanalytes, however, this was mostly insignificant.

Serial dilution tests were performed for ICP samples showing high matrix spikes. All serial dilution results indicated the accuracy of the sample results was acceptable (Esch 1998).

Triplicate samples were analyzed or samples were rerun in cases where the RPD for total organic carbon was greater than 20 percent.

Uranium contamination was detected in all preparation blanks. For 5 of 11 samples analyzed, sample results were less than 20 times the concentration of uranium detected in the blank. These results should be considered suspect. The samples were not reanalyzed because although uranium is requested for the historical program, it is not expected to be a significant analyte in this tank.

Strontium-90 activity was detected in the preparation blanks for 8 of 11 samples analyzed. For two samples (core 226, segment 11R, and core 228, segment 11), the sample results were less than 10 times the concentration measured in the preparation blank. No reanalysis was performed on these samples.

In summary, the vast majority of QC results were within the boundaries specified in the sampling and analysis plans (Field 1997 and Sasaki 1997). Total uranium and strontium-90 analytes with significant blank contamination should be considered suspect and should not be used. Other discrepancies mentioned in this section or footnoted in the data summary tables should not impact data validity or use.

B3.3 DATA CONSISTENCY CHECKS

Comparing different analytical methods is helpful in assessing the consistency and quality of the data. Several comparisons were possible with the data set provided by the two core samples: a comparison of phosphorous and sulfur as analyzed by ICP to phosphate and sulfate as analyzed by IC. In addition, mass and charge balances were calculated to help assess the overall data consistency.

B3.3.1 Comparison of Results from Different Analytical Methods

The following data consistency checks compare the results for segment fuel data from two analytical methods. Agreement between the two methods strengthens the credibility of both results, but poor agreement brings the reliability of the data into question. All analytical mean results were taken from Section B2.0 tables.

B3.3.1.1 Phosphate. The analytical phosphorous mean result as determined by ICP was 1,710 μg/g which converts to 5,240 μg/g of phosphate. This compared well with the IC phosphate mean result of 5,760 μg/g. The RPD between these two phosphate results was nine percent. The IC value will be used for mass and charge balance calculations.

B3.3.1.2 Sulfate. The analytical sulfur mean result as determined by ICP was 4,640 μg/g which converts to 13,900 μg/g of sulfate. This compared well with the IC sulfate mean result of 14,100 μg/g. The RPD between these two sulfate results was 1.4 percent. The IC value will be used for the mass and charge balance calculations.

B3.3.1.3 Total Beta. The analytical total beta result was 205 μCi/g. This compares well with the combined ^{137}Cs and ^{90}Sr value of 212 μCi/g, with an RPD of three percent.

B3.3.2 Mass and Charge Balance

The principal objective in performing mass and charge balances is to determine whether the measurements are consistent. In calculating the balances, only the segment level mean analytes listed in Table B3-4, which were detected at a concentration of 1,000 μg/g or greater, were considered. Only the acid digest data were used for ICP analytes.

Except for sodium and potassium, the cations listed in Table B3-1 were assumed to be in their most common hydroxide or oxide form, and the concentrations of the assumed species were calculated stoichiometrically. Because precipitates are neutral species, all positive charge was attributed to the sodium and potassium cations. The anions listed in Table B3-2 were assumed to be present as sodium and potassium salts and were expected to balance the positive charge exhibited by the cations. Phosphate, as determined by IC, is assumed to be completely water soluble and appears only in the anion mass and charge calculations. The concentrations of cationic species in Table B3-1, the anionic species in Table B3-2, and the percent water were ultimately used to calculate the mass balance.

The mass balance was calculated from the formula below. The factor 0.0001 is the conversion factor from μg/g to weight percent.

Mass balance = % Water + 0.0001 x {total analyte concentration}

The total analyte concentrations calculated from the above equation is 666,220 μg/g. The mean weight percent water (obtained from the gravimetric analyses reported in Table B3-3) is 35.7 percent or 357,000 μg/g. The mass balance resulting from adding the percent water to the total analyte concentration is 102 percent (see Table B3-3).

Cation and anion microequivalent values were determined by dividing the concentration of each analyte species by the atomic mass for that species and multiplying by the species valence. Results are included in Table B3-1 to B3-3. The charge balance is the ratio of positive charge and negative charge microequivalents. The charge balance was 1.13. The higher positive charge indicates that some anions may not be fully accounted for by the analyses. Based on drainable liquid results, this may be caused by the presence of hydroxide not analyzed for in the solids.

In summary, the above calculations yield reasonable mass balance values (close to 100 percent). The charge balance appears deficient in anion, most likely attributed to the lack of hydroxide data.

Table B3-1. Cation Mass and Charge Data.

Analyte	Concentration ($\mu g/g$)	Assumed Species	Concentration of Assumed Species ($\mu g/g$)	Charge ($\mu eq/g$)
Aluminum	23,100	$Al(OH)_3$	66,700	0
Potassium	3,370	K^{+1}	3,370	86.2
Iron	1,100	$Fe(OH)_3$	2,100	0
Sodium	2.05E+05	Na^{+1}	2.05E+05	8,910
Totals			277,170	8996.2

Table B3-2. Anion Mass and Charge Data.

Analyte	Concentration ($\mu g/g$)	Charge ($\mu eq/g$)
TIC as CO_3^{2-}	55,000	1,830
Chloride $^{-}$	3,820	108
Nitrate $^{-}$	2.06E+05	3,320
Nitrite $^{-}$	86,400	1,880
Oxalate $^{2-}$	7,600	173
Phosphate $^{3-}$	5,760	182
Sulfate $^{2-}$	14,100	294
Acetate (TOC) $^{-}$	4,168	141
Totals	382,806	7,928

Table B3-3. Mass and Charge Balance Totals.

Totals	Concentrations ($\mu g/g$)	Charge ($\mu eq/g$)
Total from Table B3-1 (cations)	277,770	+8,996
Total from Table B3-3 (anions)	382,800	-7,928
Water percent	35.7%	0
Total	1,017,976	+1,068

B3.4 MEAN CONCENTRATIONS AND CONFIDENCE INTERVALS

B3.4.1 Solid Data

A nested analysis of variance (ANOVA) model was fit to the core segment data. Mean values and 95 percent confidence intervals on the mean were determined from the ANOVA. Four variance components were used in the calculations. The variance components represent concentration differences between risers, segments, laboratory samples, and analytical replicates. The model is:

$$Y_{ijkm} = \mu + R_i + S_{ij} + L_{ijk} + A_{ijkm},$$

$$I=1,2,\ldots,a;\ j=1,2,\ldots,b_i;\ k=1,2,\ldots,c_{ij};m=1,2,\ldots,n_{ijk}$$

where

Y_{ijkm}	=	concentration from the mth analytical result of the kth sample of the jth segment of the ith riser
μ	=	the mean
R_i	=	the effect of the ith riser
S_{ij}	=	the effect of the jth segment from the ith riser
L_{ijk}	=	the effect of the kth sample from the jth segment of the ith riser
A_{ijkm}	=	the analytical error
a	=	the number of risers
b_i	=	the number of segments from the ith riser
c_{ij}	=	the number of samples from the jth segment of the ith riser
n_{ijk}	=	the number of analytical results from the ijkth sample

The variables R_i, S_{ij}, and L_{ijk} are random effects. These variables, as well as A_{ijkm}, are assumed to be uncorrelated and normally distributed with means zero and variances $\sigma^2(R)$, $\sigma^2(S)$, $\sigma^2(L)$, and $\sigma^2(A)$, respectively.

The restricted maximum likelihood method was used to estimate the mean concentration and standard deviation of the mean for all analytes that had 50 percent or more of their reported values greater than the detection limit. The mean value and standard deviation of the mean were used to calculate the 95 percent confidence intervals.

Some analytes had results that were below the detection limit. In these cases, the value of the detection limit was used for nondetected results. Core 226, segment 8, RGS sample results were not included in the segment mean calculations because they were centrifuged and contained NH_4OH solution, which was added following the RGS extractions. For analytes with a majority of results below the detection limit, a simple average is all that is reported.

The lower and upper limits, LL(95 percent) and UL(95 percent), of a two-sided 95 percent confidence interval on the mean were calculated using the following equation:

$$LL(95\%) = \hat{\mu} - t_{(df, 0.025)} \times \hat{\sigma}(\hat{\mu}),$$
$$UL(95\%) = \hat{\mu} + t_{(df, 0.025)} \times \hat{\sigma}(\hat{\mu}).$$

In this equation, $\hat{\mu}$ is the restricted maximum likelihood method estimate of the mean concentration, $\hat{\sigma}(\hat{\mu})$ is the restricted maximum likelihood method estimate of the standard deviation of the mean, and $t_{(df, 0.025)}$ is the quantile from Student's t distribution with *df* degrees of freedom. The degrees of freedom equals the number of risers with data minus one. In cases where the lower limit of the confidence interval was negative, it is reported as zero.

Table B3-4. Tank 241-AX-101 95 Percent Two-Sided Confidence Interval for the Mean Concentration for Solid Subdivision Data. (4 sheets)

Analyte	Method	Mean	df	LL	UL	Units
Aluminum	ICP:A	2.31E+04	1	1.45E+04	3.17E+04	μg/g
Aluminum	ICP:W	2.17E+04	1	0.00E+00	4.72E+04	μg/g
Antimony[1]	ICP:A	<3.34E+01	n/a	n/a	n/a	μg/g
Antimony[1]	ICP:W	<3.13E+01	n/a	n/a	n/a	μg/g
Arsenic[1]	ICP:A	<5.56E+01	n/a	n/a	n/a	μg/g
Arsenic[1]	ICP:W	<5.22E+01	n/a	n/a	n/a	μg/g
Barium[1]	ICP:A	<2.78E+01	n/a	n/a	n/a	μg/g
Barium[1]	ICP:W	<2.61E+01	n/a	n/a	n/a	μg/g
Beryllium[1]	ICP:A	<2.78E+00	n/a	n/a	n/a	μg/g
Beryllium[1]	ICP:W	<2.61E+00	n/a	n/a	n/a	μg/g
Bismuth[1]	ICP:A	<5.56E+01	n/a	n/a	n/a	μg/g
Bismuth[1]	ICP:W	<5.22E+01	n/a	n/a	n/a	μg/g
Boron[1]	ICP:A	9.85E+01	1	0.00E+00	2.04E+02	μg/g
Boron	ICP:W	6.03E+02	1	2.31E+02	9.75E+02	μg/g

Table B3-4. Tank 241-AX-101 95 Percent Two-Sided Confidence Interval for the Mean Concentration for Solid Subdivision Data. (4 sheets)

Analyte	Method	Mean	df	LL	UL	Units
Bromide[1]	IC:W	1.19E+03	1	0.00E+00	3.55E+03	μg/g
Cadmium[1]	ICP:A	7.06E+00	1	0.00E+00	1.81E+01	μg/g
Cadmium[1]	ICP:W	<2.61E+00	n/a	n/a	n/a	μg/g
Calcium[1]	ICP:A	2.41E+02	1	0.00E+00	5.70E+02	μg/g
Calcium[1]	ICP:W	<5.22E+01	n/a	n/a	n/a	μg/g
Cerium[1]	ICP:A	<5.56E+01	n/a	n/a	n/a	μg/g
Cerium[1]	ICP:W	<5.22E+01	n/a	n/a	n/a	μg/g
Cesium-137	GEA:F	2.00E+02	1	1.01E+02	3.00E+02	μCi/g
Chloride	IC:W	3.82E+03	1	2.11E+03	5.53E+03	μg/g
Chromium	ICP:A	1.45E+03	1	0.00E+00	4.46E+03	μg/g
Chromium	ICP:W	3.72E+01	1	0.00E+00	8.39E+01	μg/g
Cobalt[1]	ICP:A	<1.11E+01	n/a	n/a	n/a	μg/g
Cobalt[1]	ICP:W	<1.04E+01	n/a	n/a	n/a	μg/g
Cobalt-60[1]	GEA:F	<3.91E-02	n/a	n/a	n/a	μCi/g
Copper[1]	ICP:A	<5.71E+00	n/a	n/a	n/a	μg/g
Copper[1]	ICP:W	<5.22E+00	n/a	n/a	n/a	μg/g
Fluoride[1]	IC:W	5.50E+02	1	0.00E+00	1.10E+03	μg/g
Gross alpha[1]	Alpha:F	4.06E-02	1	0.00E+00	1.18E-01	μCi/g
Gross beta	Alpha:F	2.05E+02	1	0.00E+00	5.18E+02	μCi/g
Iron[1]	ICP:A	1.10E+03	1	0.00E+00	1.34E+04	μg/g
Iron[1]	ICP:W	<2.61E+01	n/a	n/a	n/a	μg/g
Lanthanum[1]	ICP:A	<2.78E+01	n/a	n/a	n/a	μg/g
Lanthanum[1]	ICP:W	<2.61E+01	n/a	n/a	n/a	μg/g
Lead[1]	ICP:A	7.96E+01	1	4.59E+01	1.13E+02	μg/g
Lead[1]	ICP:W	<5.80E+01	n/a	n/a	n/a	μg/g
Lithium[1]	ICP:A	5.63E+01	1	0.00E+00	3.49E+02	μg/g
Lithium[1]	ICP:W	<7.45E+00	n/a	n/a	n/a	μg/g
Magnesium[1]	ICP:A	<5.62E+01	n/a	n/a	n/a	μg/g
Magnesium[1]	ICP:W	<5.22E+01	n/a	n/a	n/a	μg/g
Manganese[1]	ICP:A	2.21E+01	1	0.00E+00	8.07E+01	μg/g
Manganese[1]	ICP:W	<5.22E+00	n/a	n/a	n/a	μg/g
Molybdenum[1]	ICP:A	5.92E+01	1	3.96E+01	7.87E+01	μg/g

Table B3-4. Tank 241-AX-101 95 Percent Two-Sided Confidence Interval for the Mean Concentration for Solid Subdivision Data. (4 sheets)

Analyte	Method	Mean	df	LL	UL	Units
Molybdenum	ICP:W	5.59E+01	1	0.00E+00	1.22E+02	μg/g
Neodymium[1]	ICP:A	<5.56E+01	n/a	n/a	n/a	μg/g
Neodymium[1]	ICP:W	<5.22E+01	n/a	n/a	n/a	μg/g
Nickel[1]	ICP:A	5.30E+01	1	0.00E+00	1.44E+02	μg/g
Nickel[1]	ICP:W	<1.04E+01	n/a	n/a	n/a	μg/g
Nitrate[1]	IC:W	2.06E+05	1	1.23E+04	3.99E+05	μg/g
Nitrite	IC:W	8.64E+04	1	0.00E+00	1.78E+05	μg/g
Oxalate[1]	IC:W	7.60E+03	1	0.00E+00	2.02E+04	μg/g
Percent H_2O	DSC/TGA	3.57E+01	1	2.26E+01	4.88E+01	%
Phosphate	IC:W	5.76E+03	1	1.49E+03	1.00E+04	μg/g
Phosphorus	ICP:A	1.71E+03	1	0.00E+00	3.41E+03	μg/g
Phosphorus	ICP:W	2.05E+03	1	0.00E+00	9.14E+03	μg/g
Potassium	ICP:A	3.37E+03	1	1.99E+03	4.76E+03	μg/g
Potassium	ICP:W	3.24E+03	1	0.00E+00	6.90E+03	μg/g
Samarium[1]	ICP:A	<5.56E+01	n/a	n/a	n/a	μg/g
Samarium[1]	ICP:W	<5.22E+01	n/a	n/a	n/a	μg/g
Silicon	ICP:A	1.67E+02	1	0.00E+00	3.47E+02	μg/g
Silicon	ICP:W	6.97E+02	1	0.00E+00	3.00E+03	μg/g
Silver	ICP:A	1.72E+01	1	9.01E+00	2.54E+01	μg/g
Silver	ICP:W	1.58E+01	1	1.13E+01	2.04E+01	μg/g
Sodium	ICP:A	2.05E+05	1	1.65E+05	2.45E+05	μg/g
Sodium	ICP:W	2.15E+05	1	1.61E+05	2.69E+05	μg/g
Strontium[1]	ICP:A	<5.56E+00	n/a	n/a	n/a	μg/g
Strontium[1]	ICP:W	<5.22E+00	n/a	n/a	n/a	μg/g
Strontium-89/90	Sr:F	1.19E+01	1	0.00E+00	1.01E+02	μCi/g
Sulfate[1]	IC:W	1.41E+04	1	0.00E+00	4.07E+04	μg/g
Sulfur	ICP:A	4.64E+03	1	0.00E+00	1.34E+04	μg/g
Sulfur	ICP:W	2.86E+03	1	0.00E+00	2.36E+04	μg/g
Thallium[1]	ICP:A	<1.11E+02	n/a	n/a	n/a	μg/g
Thallium[1]	ICP:W	<1.04E+02	n/a	n/a	n/a	μg/g
Titanium[1]	ICP:A	<5.56E+00	n/a	n/a	n/a	μg/g
Titanium[1]	ICP:W	<5.22E+00	n/a	n/a	n/a	μg/g

Table B3-4. Tank 241-AX-101 95 Percent Two-Sided Confidence Interval for the Mean Concentration for Solid Subdivision Data. (4 sheets)

Analyte	Method	Mean	df	LL	UL	Units
Total inorganic carbon	TIC/TOC	1.10E+04	1	0.00E+00	3.03E+04	µg/g
Total organic carbon	Furnace Oxidation:W	2.82E+03	1	0.00E+00	1.23E+04	µg/g
Total organic carbon[1]	TIC/TOC	3.77E+03	1	1.68E+03	5.86E+03	µg/g
Uranium[1]	ICP:A	3.94E+02	1	4.34E+01	7.45E+02	µg/g
Uranium[1]	ICP:W	<2.61E+02	n/a	n/a	n/a	µg/g
Uranium	U:F	1.60E+02	1	0.00E+00	1.29E+03	µg/g
Vanadium[1]	ICP:A	<2.78E+01	n/a	n/a	n/a	µg/g
Vanadium[1]	ICP:W	<2.61E+01	n/a	n/a	n/a	µg/g
Zinc[1]	ICP:A	3.24E+01	1	0.00E+00	2.39E+02	µg/g
Zinc[1]	ICP:W	<5.22E+00	n/a	n/a	n/a	µg/g
Zirconium[1]	ICP:A	1.64E+01	1	0.00E+00	4.26E+01	µg/g
Zirconium[1]	ICP:W	<5.22E+00	n/a	n/a	n/a	µg/g
Bulk density	Bulk density	1.67	1	1.18	2.16	µg/mL

Note:

[1]A "less than" value was used in the calculation.

The model fit to the core composite data was a nested ANOVA model. Two variance components were used in the calculations. The variance components represent concentration differences between samples taken from different risers and between analytical replicates. The model is:

$$Y_{ijk} = \mu + R_i + A_{ij},$$

$$I=1,2,\ldots,a;\ j=1,2,\ldots,n_i;$$

where

Y_{ijk} = concentration from the k^{th} analytical result of the j^{th} sample from the i^{th} segment

μ = the mean

R_i = the effect of the i^{th} riser

A_{ij} = the analytical error

a = the number of risers

n_i = the number of analytical results from the i^{th} riser

The variable R_i is a random effect. This variable, along with A_{ij}, is assumed to be uncorrelated and normally distributed with means zero and variances $\sigma^2(R)$, and $\sigma^2(A)$ respectively. The *df* associated with the standard deviation of the mean is the number of risers with data minus one.

Table B3-5. Tank 241-AX-101 95 Percent Two-Sided Confidence Interval for the Mean Concentration for Solid Core Composite Data. (4 sheets)

Analyte	Method	Mean	df	LL	UL	Units
Aluminum	ICP:A	1.99E+04	1	0.00E+00	8.79E+04	µg/g
Aluminum	ICP:W	1.89E+04	1	0.00E+00	8.27E+04	µg/g
Antimony[1]	ICP:A	<3.33E+01	n/a	n/a	n/a	µg/g
Antimony[1]	ICP:W	<3.53E+01	n/a	n/a	n/a	µg/g
Arsenic[1]	ICP:A	<5.54E+01	n/a	n/a	n/a	µg/g
Arsenic[1]	ICP:W	<5.88E+01	n/a	n/a	n/a	µg/g
Barium[1]	ICP:A	<2.77E+01	n/a	n/a	n/a	µg/g
Barium[1]	ICP:W	<2.94E+01	n/a	n/a	n/a	µg/g
Beryllium[1]	ICP:A	<2.77E+00	n/a	n/a	n/a	µg/g
Beryllium[1]	ICP:W	<2.94E+00	n/a	n/a	n/a	µg/g
Bismuth[1]	ICP:A	<5.54E+01	n/a	n/a	n/a	µg/g
Bismuth[1]	ICP:W	<5.88E+01	n/a	n/a	n/a	µg/g
Boron	ICP:A	1.60E+02	1	0.00E+00	3.41E+02	µg/g
Boron	ICP:W	5.09E+02	1	0.00E+00	1.38E+03	µg/g
Bromide	IC:W	1.24E+03	1	7.61E+02	1.73E+03	µg/g
Cadmium	ICP:A	8.88E+00	1	0.00E+00	1.87E+01	µg/g
Cadmium[1]	ICP:W	<2.94E+00	n/a	n/a	n/a	µg/g
Calcium	ICP:A	3.72E+02	1	0.00E+00	2.38E+03	µg/g
Calcium[1]	ICP:W	<5.88E+01	n/a	n/a	n/a	µg/g
Cerium[1]	ICP:A	<5.54E+01	n/a	n/a	n/a	µg/g
Cerium[1]	ICP:W	<5.88E+01	n/a	n/a	n/a	µg/g
Cesium-137	GEA:F	1.62E+02	1	0.00E+00	6.90E+02	µCi/g

Table B3-5. Tank 241-AX-101 95 Percent Two-Sided Confidence Interval for the Mean Concentration for Solid Core Composite Data. (4 sheets)

Analyte	Method	Mean	df	LL	UL	Units
Chloride	IC:W	3.56E+03	1	0.00E+00	1.53E+04	µg/g
Chromium	ICP:A	2.04E+03	1	1.29E+02	3.94E+03	µg/g
Chromium	ICP:W	8.58E+01	1	6.13E+01	1.10E+02	µg/g
Cobalt[1]	ICP:A	<1.11E+01	n/a	n/a	n/a	µg/g
Cobalt[1]	ICP:W	<1.18E+01	n/a	n/a	n/a	µg/g
Cobalt-60[1]	GEA:F	<2.68E-02	n/a	n/a	n/a	µCi/g
Copper[1]	ICP:A	<5.54E+00	n/a	n/a	n/a	µg/g
Copper[1]	ICP:W	<5.88E+00	n/a	n/a	n/a	µg/g
Fluoride	IC:W	6.73E+02	1	0.00E+00	1.37E+03	µg/g
Gross alpha	Alpha:F	4.69E-02	1	0.00E+00	9.56E-02	µCi/g
Gross beta	Alpha:F	2.20E+02	1	0.00E+00	7.02E+02	µCi/g
Iron	ICP:A	5.94E+02	1	0.00E+00	6.38E+03	µg/g
Iron[1]	ICP:W	<2.94E+01	n/a	n/a	n/a	µg/g
Lanthanum[1]	ICP:A	<2.77E+01	n/a	n/a	n/a	µg/g
Lanthanum[1]	ICP:W	<2.94E+01	n/a	n/a	n/a	µg/g
Lead	ICP:A	1.46E+02	1	0.00E+00	1.04E+03	µg/g
Lead[1]	ICP:W	<5.88E+01	n/a	n/a	n/a	µg/g
Lithium	ICP:A	5.13E+01	1	0.00E+00	2.71E+02	µg/g
Lithium[1]	ICP:W	<5.88E+00	n/a	n/a	n/a	µg/g
Magnesium[1]	ICP:A	<5.54E+01	n/a	n/a	n/a	µg/g
Magnesium[1]	ICP:W	<5.88E+01	n/a	n/a	n/a	µg/g
Manganese	ICP:A	2.46E+01	1	0.00E+00	8.05E+01	µg/g
Manganese[1]	ICP:W	<5.88E+00	n/a	n/a	n/a	µg/g
Molybdenum	ICP:A	4.91E+01	1	0.00E+00	2.30E+02	µg/g
Molybdenum	ICP:W	4.94E+01	1	0.00E+00	2.11E+02	µg/g
Neodymium[1]	ICP:A	<5.54E+01	n/a	n/a	n/a	µg/g
Neodymium[1]	ICP:W	<5.88E+01	n/a	n/a	n/a	µg/g
Nickel	ICP:A	6.91E+01	1	0.00E+00	1.69E+02	µg/g
Nickel[1]	ICP:W	<1.18E+01	n/a	n/a	n/a	µg/g
Nitrate	IC:W	2.32E+05	1	0.00E+00	1.13E+06	µg/g
Nitrite	IC:W	7.69E+04	1	0.00E+00	2.93E+05	µg/g
Oxalate	IC:W	1.03E+04	1	0.00E+00	3.97E+04	µg/g

Table B3-5. Tank 241-AX-101 95 Percent Two-Sided Confidence Interval for the Mean Concentration for Solid Core Composite Data. (4 sheets)

Analyte	Method	Mean	df	LL	UL	Units
Percent H_2O	DSC/TGA	3.25E+01	1	0.00E+00	1.32E+02	%
Phosphate	IC:W	7.31E+03	1	5.62E+03	9.01E+03	µg/g
Phosphorus	ICP:A	2.22E+03	1	0.00E+00	5.26E+03	µg/g
Phosphorus	ICP:W	2.14E+03	1	2.07E+03	2.20E+03	µg/g
Potassium	ICP:A	2.87E+03	1	0.00E+00	1.25E+04	µg/g
Potassium	ICP:W	2.81E+03	1	0.00E+00	1.11E+04	µg/g
Samarium[1]	ICP:A	<5.54E+01	n/a	n/a	n/a	µg/g
Samarium[1]	ICP:W	<5.88E+01	n/a	n/a	n/a	µg/g
Silicon	ICP:A	1.73E+02	1	0.00E+00	4.31E+02	µg/g
Silicon	ICP:W	2.55E+02	1	0.00E+00	6.20E+02	µg/g
Silver	ICP:A	1.74E+01	1	0.00E+00	3.90E+01	µg/g
Silver	ICP:W	1.55E+01	1	0.00E+00	3.30E+01	µg/g
Sodium	ICP:A	2.20E+05	1	5.68E+02	4.39E+05	µg/g
Sodium	ICP:W	2.17E+05	1	1.66E+04	4.17E+05	µg/g
Strontium[1]	ICP:A	<5.54E+00	n/a	n/a	n/a	µg/g
Strontium[1]	ICP:W	<5.88E+00	n/a	n/a	n/a	µg/g
Strontium-89/90	Sr:F	3.04E+01	1	4.01E+00	5.67E+01	µCi/g
Sulfate	IC:W	1.86E+04	1	0.00E+00	5.88E+04	µg/g
Sulfur	ICP:A	6.57E+03	1	0.00E+00	2.26E+04	µg/g
Sulfur	ICP:W	6.68E+03	1	0.00E+00	1.93E+04	µg/g
Thallium[1]	ICP:A	<1.11E+02	n/a	n/a	n/a	µg/g
Thallium[1]	ICP:W	<1.18E+02	n/a	n/a	n/a	µg/g
Titanium[1]	ICP:A	<5.54E+00	n/a	n/a	n/a	µg/g
Titanium[1]	ICP:W	<5.88E+00	n/a	n/a	n/a	µg/g
Total inorganic carbon	TIC/TOC	1.45E+04	1	0.00E+00	4.85E+04	µg/g
Total organic carbon	TIC/TOC	4.03E+03	1	2.37E+01	8.04E+03	µg/g
Uranium	ICP:A	4.21E+02	1	0.00E+00	1.17E+03	µg/g
Uranium[1]	ICP:W	<2.94E+02	n/a	n/a	n/a	µg/g
Uranium	U:F	4.07E+02	1	0.00E+00	8.83E+02	µg/g
Vanadium[1]	ICP:A	<2.77E+01	n/a	n/a	n/a	µg/g
Vanadium[1]	ICP:W	<2.94E+01	n/a	n/a	n/a	µg/g
Zinc	ICP:A	2.08E+01	1	0.00E+00	2.00E+02	µg/g

Table B3-5. Tank 241-AX-101 95 Percent Two-Sided Confidence Interval for the Mean Concentration for Solid Core Composite Data. (4 sheets)

Analyte	Method	Mean	df	LL	UL	Units
Zinc[1]	ICP:W	<5.88E+00	n/a	n/a	n/a	μg/g
Zirconium	ICP:A	2.36E+01	1	0.00E+00	5.76E+01	μg/g
Zirconium[1]	ICP:W	<5.88E+00	n/a	n/a	n/a	μg/g

Note:

[1]A "less than" value was used in the calculation.

B3.4.2 Liquid Data

An ANOVA model was fit to the liquid segment data. Mean values, and 95 percent confidence intervals on the mean, were determined from the ANOVA. Three variance components were used in the calculations. The variance components represent concentration differences between risers, laboratory samples, and analytical replicates. The model is:

$$Y_{ijk} = \mu + R_i + L_{ij} + A_{ijk},$$

$$I=1,2,\ldots,a;\ j=1,2,\ldots,b_i;\ k=1,2,\ldots,n_{ij};$$

where

Y_{ijk} = concentration from the k^{th} analytical result of the m^{th} sample from the i^{th} riser

μ = the mean

R_i = the effect of the i^{th} riser

L_{ij} = the effect of the j^{th} sample from the i^{th} riser

A_{ijk} = the analytical error

a = the number of risers

b_i = the number of segments from the i^{th} riser

n_{ij} = the number of samples from the ij^{th} sample

The variables R_i and L_{ij} are random effects. These variables, as well as A_{ijk}, are assumed to be uncorrelated and normally distributed with means zero and variances $\sigma^2(R)$, $\sigma^2(L)$ and $\sigma^2(A)$, respectively. The *df* associated with the standard deviation of the mean is the number of risers with data minus one.

Table B3-6. Tank 241-AX-101 95 Percent Two-Sided Confidence Interval for the Mean Concentration for Liquid Subdivision Data. (2 sheets)

Analyte	Method	Mean	df	LL	UL	Units
Aluminum	ICP	5.36E+04	1	0.00E+00	1.13E+05	μg/mL
Antimony[1]	ICP	<3.24E+01	n/a	n/a	n/a	μg/mL
Arsenic[1]	ICP	<5.39E+01	n/a	n/a	n/a	μg/mL
Barium[1]	ICP	<2.70E+01	n/a	n/a	n/a	μg/mL
Beryllium[1]	ICP	<2.69E+00	n/a	n/a	n/a	μg/mL
Bismuth[1]	ICP	<5.39E+01	n/a	n/a	n/a	μg/mL
Boron[1]	ICP	5.23E+01	1	8.50E+00	9.60E+01	μg/mL
Bromide[1]	IC	1.59E+03	1	0.00E+00	4.22E+03	μg/mL
Cadmium[1]	ICP	<2.74E+00	n/a	n/a	n/a	μg/mL
Calcium[1]	ICP	<5.39E+01	n/a	n/a	n/a	μg/mL
Cerium[1]	ICP	<5.39E+01	n/a	n/a	n/a	μg/mL
Chloride	IC	9.56E+03	1	0.00E+00	3.40E+04	μg/mL
Chromium	ICP	8.72E+01	1	4.19E+01	1.33E+02	μg/mL
Cobalt[1]	ICP	<1.08E+01	n/a	n/a	n/a	μg/mL
Copper[1]	ICP	<5.40E+00	n/a	n/a	n/a	μg/mL
Fluoride[1]	IC	<8.52E+01	n/a	n/a	n/a	μg/mL
Gross alpha[1]	Alpha Rad	<2.16E-02	n/a	n/a	n/a	μCi/mL
Iron[1]	ICP	<2.70E+01	n/a	n/a	n/a	μg/mL
Lanthanum[1]	ICP	<2.70E+01	n/a	n/a	n/a	μg/mL
Lead[1]	ICP	1.49E+02	1	0.00E+00	3.07E+02	μg/mL
Lithium[1]	ICP	9.85E+00	1	0.00E+00	3.83E+01	μg/mL
Magnesium[1]	ICP	<5.39E+01	n/a	n/a	n/a	μg/mL
Manganese[1]	ICP	<5.39E+00	n/a	n/a	n/a	μg/mL
Molybdenum	ICP	1.41E+02	1	1.06E+01	2.72E+02	μg/mL
Neodymium[1]	ICP	<5.39E+01	n/a	n/a	n/a	μg/mL
Nickel[1]	ICP	<1.08E+01	n/a	n/a	n/a	μg/mL
Nitrate	IC	1.49E+05	1	0.00E+00	4.75E+05	μg/mL

Table B3-6. Tank 241-AX-101 95 Percent Two-Sided Confidence Interval for the Mean Concentration for Liquid Subdivision Data. (2 sheets)

Analyte	Method	Mean	df	LL	UL	Units
Nitrite	IC	1.62E+05	1	0.00E+00	4.96E+05	μg/mL
Oxalate[1]	IC	<8.61E+02	n/a	n/a	n/a	μg/mL
Percent H2O	DSC/TGA	4.80E+01	1	4.25E+01	5.35E+01	%
Phosphate	IC	3.06E+03	1	0.00E+00	9.85E+03	μg/mL
Phosphorus	ICP	9.62E+02	1	1.33E+02	1.79E+03	μg/mL
Potassium	ICP	7.98E+03	1	8.02E+02	1.52E+04	μg/mL
Samarium[1]	ICP	<5.39E+01	n/a	n/a	n/a	μg/mL
Silicon	ICP	1.25E+02	1	0.00E+00	5.30E+02	μg/mL
Silver	ICP	1.79E+01	1	7.58E+00	2.83E+01	μg/mL
Sodium	ICP	2.54E+05	1	1.42E+05	3.65E+05	μg/mL
Specific gravity	Specific gravity	1.47E+00	1	1.30E+00	1.65E+00	unitless
Strontium[1]	ICP	<5.39E+00	n/a	n/a	n/a	μg/mL
Sulfate[1]	IC	2.20E+03	1	0.00E+00	1.12E+04	μg/mL
Sulfur	ICP	7.37E+02	1	0.00E+00	1.98E+03	μg/mL
Thallium[1]	ICP	<1.08E+02	n/a	n/a	n/a	μg/mL
Titanium[1]	ICP	<5.39E+00	n/a	n/a	n/a	μg/mL
Total inorganic carbon	TIC/TOC	2.21E+03	1	0.00E+00	8.86E+03	μg/mL
Total organic carbon	Furnace oxidation (TOC)	3.47E+03	1	1.05E+03	5.90E+03	μg/mL
Total organic carbon[1]	TIC/TOC	3.48E+03	1	0.00E+00	8.22E+03	μg/mL
Uranium[1]	ICP	<2.69E+02	n/a	n/a	n/a	μg/mL
Vanadium[1]	ICP	<2.70E+01	n/a	n/a	n/a	μg/mL
Zinc[1]	ICP	<5.39E+00	n/a	n/a	n/a	μg/mL
Zirconium[1]	ICP	<5.39E+00	n/a	n/a	n/a	μg/mL

Note:

[1]A "less than" value was used in the calculation.

B4.0 APPENDIX B REFERENCES

Agnew, S. F., J. Boyer, R. A. Corbin, T. B. Duran, J. R. Fitzpatrick, K. A. Jurgensen, T. P. Ortiz, and B. L. Young, 1997, *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4*, LA-UR-96-3860, Los Alamos National Laboratory, Los Alamos, New Mexico.

Bauer, R. E., and L. P. Jackson, 1998, *Data Quality Objective to Support Resolution of the Flammable Gas Safety Issue*, HNF-SD-WM-DQO-004, Rev. 3A, DE&S Hanford, Inc. for Fluor Daniel Hanford, Inc., Richland, Washington.

Brothers, J. W., 1998, *Preliminary Retained Gas Sampler Measurement Results for Hanford Waste Tank 241-AX-101*, (letter TWS98.37 to R. E. Bauer from J. W. Brothers, November 10), Pacific Northwest National Laboratory, Richland, Washington.

Caprio, G. S., 1995, *Vapor and Gas Sampling of Single-Shell tank 241-AX-101 Using the Vapor Sampling System*, WHC-SD-WM-RPT-170, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Dukelow, G. T., J. W. Hunt, H. Babad, and J. E Meacham, 1995, *Tank Safety Screening Data Quality Objective*, WHC-SD-WM-SP-004, Rev. 2, Westinghouse Hanford Company, Richland, Washington.

Esch, 1998, *Tank 241-AX-101, Cores 226 and 228, Analytical Results for the Final Report*, HNF-SD-WM-DP-300, Rev. 0, Waste Management Federal Services of Hanford Inc. for Fluor Daniel Hanford, Inc., Richland, Washington.

Esch, 1997, *Tank 241-AX-101, Grab Samples, 1AX-97-1 Through 1AX-97-3 Analytical Results for the Final Report*, HNF-SD-WM-DP-268, Rev. 0, Waste Management Federal Services of Hanford, Inc. for Fluor Daniel Hanford, Inc., Richland, Washington.

Field, J. G., 1997, *Tank 241-AX-101 Push Mode Core Sampling and Analysis Plan*, HNF-SD-WM-TSAP-107, Rev. 1, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

Fowler, K. D., 1995, *Data Quality Objectives for Tank Farms Waste Compatibility Program*, WHC-SD-WM-DQO-001, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Homi, C. S., 1995, *Vapor Sampling and Analysis Plan*, WHC-SD-WM-TP-335, Rev. 0G, Westinghouse Hanford Company, Richland, Washington.

Horton, J. E., 1975, *Analysis and Characterization of 101-AX Tank Sludge and Supernatant Liquid*, (internal memorandum to O. R. H. Rasmussen, August 4), Atlantic Richfield Hanford Company, Richland, Washington.

Horton, J. E., 1976, *Analysis of 101-AX Tank Residual Sludges*, (internal memorandum to J. W. Bailey, October 26), Atlantic Richfield Hanford Company, Richland, Washington.

Jansky, M. T., 1980a, *101 AX Boildown*, (internal memorandum 65453-80-233 to M. C. Teats, August 19), Rockwell Hanford Operations, Richland, Washington.

Jansky, M. T., 1980b, *Composition of Waste from Tank 101AX*, (internal memorandum 65453-80-293 to D. E. Bowers and D. A. Reynolds, October 7), Rockwell Hanford Operations, Richland, Washington.

Jansky, M. T., 1980c, *Tank 101AX Waste Characteristics*, (internal memorandum 65453-80-331 to M. C. Teats, November 11), Rockwell Hanford Operations, Richland, Washington.

Jansky, M. T., and D. L. Herting, 1980, *Hot Boildown of Tank 101-AX Waste*, (internal memorandum 65453-80-201 to D. E. Bowers and M. C. Teats, July 18), Rockwell Hanford Operations, Richland, Washington.

Meacham, J. E., D. L. Banning, M. R. Allen, and L. D. Muhlestein, 1997, *Data Quality Objective to Support Resolution of the Organic Solvent Safety Issue*, HNF-SD-WM-DQO-026, Rev. 0, DE&S Hanford, Inc. for Fluor Daniel Hanford, Inc., Richland, Washington.

Mulkey, C. H., and M. S. Miller, 1997, *Data Quality Objectives for Tank Farms Waste Compatibility Program*, WHC-SD-WM-DQO-001, Rev. 2, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

Osborne, J. W. and L. L. Buckley, 1995, *Data Quality Objectives for Tank Hazardous Vapor Safety Screening*, WHC-SD-WM-DQO-002, Rev. 2, Westinghouse Hanford Company, Richland, Washington.

Pool, K. H., T. W. Clauss, J. C. Evans, B. D. McVeety, B. L. Thomas, K. B. Olsen, J. S. Fruchter, and K. L. Silvers, 1996, *Headspace Vapor Characterization of Hanford Waste Tank AX-101: Results from Samples Collected on 6/15/95*, PNNL-10878, Pacific Northwest National Laboratory, Richland, Washington.

Sasaki, L. M. 1997, *Compatibility Grab Sampling and Analysis Plan for Fiscal Year 1997*, WHC-SD-WM-TSAP-115, Rev. 0G, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

Schreiber, R. D., 1997, *Memorandum of Understanding for the Organic Complexant Safety Issue Data Requirements*, HNF-SD-WM-RD-060, Rev. 0, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

Simpson, B. C., and D. J. McCain, 1997, *Historical Model Evaluation Data Requirements*, WHC-SD-WM-DQO-018, Rev. 2, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

WHC, 1992, *Safety Department Adiministration Manual*, WHC-IP-0030, Westinghouse Hanford Company, Richland, Washington.

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APPENDIX C

STATISTICAL ANALYSIS FOR ISSUE RESOLUTION

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APPENDIX C

STATISTICAL ANALYSIS FOR ISSUE RESOLUTION

Appendix C documents the results of the analyses and statistical and numerical manipulations required by the DQOs applicable for tank 241-AX-101. The analyses required for tank 241-AX-101 are as follows:

- **Section C1.0**: Statistical analysis and numerical manipulations supporting the safety screening DQO (Dukelow et al. 1995)
- **Section C2.0**: Gateway analysis for the historical model DQO (Simpson and McCain 1997)
- **Section C3.0**: Analysis for hydrostatic head fluid
- **Section C4.0**: Appendix C References.

C1.0 STATISTICS FOR THE SAFETY SCREENING DATA QUALITY OBJECTIVE

The safety screening DQO (Dukelow et al. 1995) defines decision limits in terms of one-sided 95 percent confidence intervals. Based on an average bulk density of 1.675, the safety screening DQO limit was 36.7 μCi/g for gross alpha and 480 J/g for DSC. Confidence intervals were calculated for the mean values from each laboratory sample. Table C1-1 shows the gross alpha results. Table C1-2 shows the DSC results.

The upper limit of a one-sided 95 percent confidence interval on the mean is

$$\hat{\mu} + t_{(df,0.05)}\ \hat{\sigma}_{\hat{\mu}}.$$

In this equation, $\hat{\mu}$ is the arithmetic mean of the data, $\hat{\sigma}_{\hat{\mu}}$ is the estimate of the standard deviation of the mean, and $t_{(df,0.05)}$ is the quantile from Student's t distribution with *df* degrees of freedom. The degrees of freedom equals the number of samples minus one.

Table C1-1 shows the upper limit of a 95 percent confidence interval for sample numbers with at least one value above the detection limit. Each confidence interval can be used to make the following statement. If the upper limit is less than 36.7 μCi/g (61.5 μCi/mL for drainable liquid), reject the null hypothesis that the alpha is greater than or equal to 36.7 μCi/g (61.5 μCi/mL for drainable liquid) at the 0.05 level of significance.

Forty-six of 88 gross alpha results were above the detection limit. The upper limit closest to the threshold was 2.95E-01 uCi/g for core 226, segment 8. This is well below the limit of 36.7 μCi/g, indicating that criticality is not a concern for this tank.

Table C1-1. 95 Percent Upper Confidence Limits for Gross Alpha.

Lab Sample ID	Description	$\hat{\mu}$	df	UL	Units
S98T000087F	Core 226, segment 1, lower half	2.22E-02	1	6.80E-02	μCi/g
S98T000098F	Core 226, segment 2, lower half	6.16E-02	1	9.57E-02	μCi/g
S98T000122F	Core 226, segment 3, lower half	4.67E-02	1	8.52E-02	μCi/g
S98T000124F	Core 226, segment 4, lower half	5.92E-02	1	8.79E-02	μCi/g
S98T000126F	Core 226, segment 5, lower half	5.56E-02	1	6.86E-02	μCi/g
S98T000156F	Core 226, segment 6, lower half	4.92E-02	1	7.48E-02	μCi/g
S98T000158F	Core 226, segment 7, lower half	4.31E-02	1	7.78E-02	μCi/g
S98T000243F	Core 226, segment 9, lower half	5.12E-02	1	8.38E-02	μCi/g
S98T000268F	Core 226, segment 10, lower half	4.96E-02	1	8.24E-02	μCi/g
S98T000509F[1]	Core 226, segment 15, lower half	1.15E-02	1	1.91E-02	μCi/g
S98T000535F	Core 228, segment 4, lower half	8.22E-02	1	1.27E-01	μCi/g
S98T000537F	Core 228, segment 3, lower half	8.90E-02	1	1.11E-01	μCi/g
S98T000539F	Core 228, segment 2, lower half	9.68E-02	1	1.09E-01	μCi/g
S98T000590F	Core 228, segment 5, lower half	5.78E-02	1	7.46E-02	μCi/g
S98T000592F	Core 228, segment 9, lower half	4.88E-02	1	5.83E-02	μCi/g
S98T000625F	Core 228, segment 6, lower half	6.14E-02	1	1.05E-01	μCi/g
S98T000626F	Core 228, segment 7, lower half	5.14E-02	1	6.37E-02	μCi/g
S98T000628F	Core 228, segment 8, lower half	8.00E-02	1	1.15E-01	μCi/g
S98T000674F	Core 226, core composite	4.90E-02	1	1.05E-01	μCi/g
S98T000792F[1]	Core 228, segment 13, lower half	6.98E-03	1	9.95E-03	μCi/g
S98T000793F	Core 228, segment 14, lower half	2.10E-02	1	4.27E-02	μCi/g
S98T000794F	Core 228, segment 15, lower half	7.54E-03	1	1.15E-02	μCi/g
S98T000997F	Core 228, core composite	4.47E-02	1	4.70E-02	μCi/g
S98T001004F	Core 226, segment 8, fusion	2.10E-01	1	2.95E-01	μCi/g

Note:

[1]A "less than" value was used in the calculations.

Of the 132 DSC results, 101 had exothermic reactions. Table C1-2 lists a 95 percent upper confidence limit for each laboratory sample identification number. All results are expressed on a dry weight basis. Each confidence interval can be used to make the following statement. If the upper limit is less than 480 J/g, reject the null hypothesis that DSC is greater than or equal to 480 J/g at the 0.05 level of significance. The maximum upper limit to a 95 percent confidence interval on the mean for DSC was 781 J/g dry weight, for core 226, segment 15. This is above the threshold limit of 480 J/g.

Table C1-2. 95 Percent Upper Confidence Limits for Differential Scanning Calorimetry. (2 sheets)

Lab Sample Identification	Description	$\hat{\mu}$	df	UL	Units (dry weight)
S97T001896	1AX-97-1, grab	7.45E+01	1	7.66E+01	J/g
S97T001897	1AX-97-2, grab	5.37E+01	1	1.28E+02	J/g
S98T000106	Core 226, segment 3, lower half	8.96E+01	1	1.33E+02	J/g
S98T000107	Core 226, segment 4, upper half	1.04E+02	1	1.33E+02	J/g
S98T000108	Core 226, segment 4, lower half	1.27E+02	1	2.05E+02	J/g
S98T000109	Core 226, segment 5, upper half	1.01E+02	1	1.31E+02	J/g
S98T000110	Core 226, segment 5, lower half	1.13E+02	1	1.58E+02	J/g
S98T000147	Core 226, segment 6, upper half	1.08E+02	1	2.20E+02	J/g
S98T000148	Core 226, segment 6, lower half	1.21E+02	1	1.96E+02	J/g
S98T000149	Core 226, segment 7, upper half	1.17E+02	1	1.63E+02	J/g
S98T000150	Core 226, segment 7, lower half	2.57E+02	1	4.16E+02	J/g
S98T000227	Core 226, segment 9, upper half	1.04E+02	1	1.06E+02	J/g
S98T000242	Core 226, segment 9, lower half	2.41E+02	1	2.96E+02	J/g
S98T000246	Core 226, segment 10, upper half	1.88E+02	1	5.94E+02	J/g
S98T000247	Core 226, segment 11, upper half	3.13E+01	1	3.38E+01	J/g
S98T000248	Core 226, segment 12, upper half	7.13E+01	1	9.41E+01	J/g
S98T000250[1]	Core 226, segment 10, lower half	8.09E+00	1	5.92E+01	J/g
S98T000251	Core 226, segment 11, lower half	2.15E+01	1	2.55E+01	J/g
S98T000252	Core 226, segment 12, lower half	1.30E+02	1	1.48E+02	J/g
S98T000254	Core 226, segment 14, lower half	8.95E+01	1	1.95E+02	J/g
S98T000294	Core 226, segment 11R, subsample	1.84E+02	1	1.90E+02	J/g
S98T000300	Core 226, segment 12, subsample	4.79E+01	1	6.71E+01	J/g
S98T000301	Core 226, segment 13, subsample	1.37E+02	1	1.39E+02	J/g
S98T000302	Core 226, segment 14, subsample	1.34E+02	1	1.35E+02	J/g
S98T000507	Core 226, segment 15, lower half	1.47E+01	1	1.53E+01	J/g

Table C1-2. 95 Percent Upper Confidence Limits for Differential Scanning Calorimetry. (2 sheets)

Lab Sample Identification	Description	$\hat{\mu}$	df	UL	Units (dry weight)
S98T000514	Core 226, segment 15, subsample	4.45E+02	1	7.81E+02	J/g
S98T000522	Core 228, segment 4, upper half	6.59E+01	1	7.32E+01	J/g
S98T000523	Core 228, segment 4, lower half	1.06E+02	1	1.42E+02	J/g
S98T000524	Core 228, segment 3, upper half	7.23E+01	1	8.74E+01	J/g
S98T000527	Core 228, segment 2, lower half	2.20E+02	1	4.52E+02	J/g
S98T000573	Core 228, segment 5, upper half	1.30E+02	1	2.32E+02	J/g
S98T000581	Core 228, segment 5, lower half	8.58E+01	1	1.18E+02	J/g
S98T000582	Core 228, segment 9, upper half	1.06E+02	1	1.57E+02	J/g
S98T000583	Core 228, segment 9, lower half	1.03E+02	1	2.27E+02	J/g
S98T000604	Core 228, segment 6, upper half	8.41E+01	1	1.28E+02	J/g
S98T000620	Core 228, segment 6, lower half	7.83E+01	1	1.26E+02	J/g
S98T000621	Core 228, segment 7, lower half	7.45E+01	1	8.43E+01	J/g
S98T000622	Core 228, segment 8, upper half	9.29E+01	1	1.83E+02	J/g
S98T000623	Core 228, segment 8, lower half	1.10E+02	1	1.29E+02	J/g
S98T000624	Core 228, segment 10, lower half	1.72E+01	1	2.58E+01	J/g
S98T000652	Core 228, segment 7, subsample	1.80E+02	1	1.98E+02	J/g
S98T000659	Core 228, segment 10, subsample	1.46E+02	1	1.49E+02	J/g
S98T000768	Core 228, segment 11, lower half	4.41E+01	1	4.83E+01	J/g
S98T000780	Core 228, segment 11, subsample	1.79E+02	1	2.46E+02	J/g
S98T000787	Core 228, segment 12, lower half	2.82E+01	1	2.85E+01	J/g
S98T000788	Core 228, segment 13, lower half	3.46E+01	1	3.65E+01	J/g
S98T000789	Core 228, segment 14, lower half	3.33E+01	1	4.13E+01	J/g
S98T000790	Core 228, segment 15, lower half	2.74E+01	1	3.31E+01	J/g
S98T000808	Core 228, segment 12, subsample	3.78E+01	1	3.93E+01	J/g
S98T000809	Core 228, segment 13, subsample	1.01E+01	1	1.18E+01	J/g
S98T000810	Core 228, segment 14, subsample	5.66E+01	1	6.90E+01	J/g
S98T000811	Core 228, segment 15, subsample	5.82E+01	1	6.02E+01	J/g
S98T001002	Core 226, segment 8, subsample	5.11E+01	1	1.15E+02	J/g

Note:

[1]A value of zero was used for an exothermic result.

C2.0 GATEWAY ANALYSIS FOR HISTORICAL MODEL DATA QUALITY OBJECTIVE

The primary objective of the historical model evaluation DQO (Simpson and McCain 1997) is to acquire adequate information through selective tank sampling to quantify the errors associated with predicting tank waste composition based on waste transaction history and waste type compositions. The DQO identifies key waste components and their characteristic concentrations for certain waste types.

The first step in the evaluation is to compare the analytical results with DQO-defined concentration levels for a selected number of analytes. This ensures the predicted waste type may be in the tank at the predicted location. If the analytical results are ≥ 10 percent of the DQO levels (ratio of 0.1 or more), the waste type and layer identification are considered acceptable for further investigation, and additional analyses are requested on selected segments and composite samples (Simpson and McCain 1997).

Tank 241-AX-101 was listed as a priority tank in Simpson and McCain (1997). Except for a heel of SRR and PUREX high-level waste sludge, Agnew et al. (1997) predicts that tank solids are SMMA1. Sample results showed segments 11 to 14 of core 226 and core 228 were primarily drainable liquid, and segment 1 of core 228 was liner liquid. These segments were not included in the gateway analysis. Table C2-1 compares the expected and measured concentrations for the S1 saltcake with sample results for lower half samples in core 226 and core 228.

Table C2-1 also shows fingerprint analytes accounted for >85 percent of the waste mass for all segments evaluated, and analyte concentrations were greater than 10 percent of the expected values. Cesium-137 and strontium-90 concentrations were also greater than 10 percent of the expected values. They were not included in Table C2-1 because radionuclides contribute a small fraction of the total sample weight.

Table C2-1. Tank 241-AX-101 Historical Model Evaluation for A1 Saltcake. (2 sheets)

	Fingerprint Analytes (% by wt)										Analytes
Core: Segment	**Na**	**Al**	**NO_2**	**NO_3**	**PO_4**	**SO_4**	**Cr**	**CO_3**	**H_2O**	**Total >85?**	**>10% of Expected?**
226:1 lower half	19.1	0.85	1.61	40.2	0.74	0.58	0.02	3.98	34.5	Y	Y
226:2 lower half	21.0	2.59	6.98	16.2	0.48	2.01	0.14	9.75	35.8	Y	Y
226:3 lower half	21.1	2.25	6.84	19.6	0.35	1.60	0.13	6.9	33.6	Y	Y
226:4 lower half	20.9	2.47	7.66	10.5	0.63	2.57	0.22	11.3	30.4	Y	Y
226:5 lower half	21.0	2.22	7.28	14.4	0.46	2.09	0.27	10.6	33.0	Y	Y
226:6 lower half	20.7	2.45	7.67	12.1	0.38	2.44	0.24	9.55	35.0	Y	Y

Table C2-1. Tank 241-AX-101 Historical Model Evaluation for A1 Saltcake. (2 sheets)

Core: Segment	Fingerprint Analytes (% by wt) Na	Al	NO_2	NO_3	PO_4	SO_4	Cr	CO_3	H_2O	Total >85?	Analytes >10% of Expected?
226:7 lower half	21.9	2.41	8.18	11.0	0.59	2.73	0.25	9.75	34.9	Y	Y
226:9 lower half	21.6	2.44	7.68	16.3	0.58	2.77	0.24	7.20	38.4	Y	Y
226:10 lower half	20.5	2.62	8.71	12.1	0.56	1.96	0.30	9.0	39.0	Y	Y
226:15 lower half	20.5	2.25	8.93	30.7	0.45	0.35	0.03	2.99	29.5	Y	Y
228:2 lower half	21.9	2.18	7.73	15.2	0.30	2.26	0.17	9.4	33.0	Y	Y
228:3 lower half	21.2	2.25	6.92	16.6	0.39	2.19	0.22	7.95	28.4	Y	Y
228:4 lower half	21.6	2.14	7.38	15.7	0.66	1.83	0.23	7.0	36.0	Y	Y
228:5 lower half	20.7	2.06	7.97	17.1	0.42	2.32	0.22	7.85	35.0	Y	Y
228:6 lower half	21.3	2.15	6.96	18.2	0.41	2.23	0.22	9.3	33.2	Y	Y
228:7 lower half	20.1	2.35	7.63	15.9	0.42	1.84	0.04	5.65	38.8	Y	Y
228:8 lower half	21.5	2.37	7.97	14.1	0.45	2.49	0.36	7.8	34.5	Y	Y
228:9 lower half	21.9	2.62	8.55	12.1	0.44	2.53	0.49	7.95	34.4	Y	Y
228:10 lower half	20.4	2.7	10.9	24.2	0.64	<0.11	0.15	13.8	28.5	Y	Y
228:15 lower half	19.7	2.10	12.4	31.2	0.92	<0.11	0.01	0.45	43.7	Y	Y
Expected for A1 Saltcake[1]	20.5	3.70	6.8	22.0	2.3	2.10	0.18	1.90	31.7	>85	

Note:

[1]Simpson and McCain (1997)

The final test was to compare analytical results for composite samples and selected segments 5 and 15 with HDW model estimates (Agnew et al. 1997) for SMM analyte concentrations in tank 241-AX-101. Segment 4 was selected as representative of segment 1 to 10, and segment 15 was selected to further assess whether it contains any SRR and/or PUREX high-level waste sludge. Table C2-2 compares selected segment, composite, and HDW model results.

Table C2-2. Comparison of Selected Segments and Hanford Defined Waste Estimates for Tank 241-AX-101 Saltcake.

Analytes	Core 226 S 5	S 15	Comp.	Core 228 S5	S15	Comp.	HDW[1] SMM
Na (%)	21.0	20.5	23.7	20.7	19.7	20.3	18.4
Al (%)	2.22	2.25	1.46	2.06	2.10	2.53	2.72

Table C2-2. Comparison of Selected Segments and Hanford Defined Waste Estimates for Tank 241-AX-101 Saltcake.

Analytes	Core 226			Core 228			HDW[1] SMM
	S 5	S 15	Comp.	S5	S15	Comp.	
NO_2 (%)	7.28	8.93	5.98	7.97	12.4	9.39	6.76
NO_3 (%)	14.4	30.7	30.3	17.1	31.2	16.4	15.7
CO_3 (%)	10.6	2.99	8.55	7.85	0.45	5.90	1.83
PO_4 (%)	0.46	0.45	0.75	0.42	0.92	0.72	0.53
SO_4 (%)	2.09	0.35	2.17	2.32	<0.11	1.54	1.64
Cr (%)	0.27	0.03	0.22	0.22	0.01	0.19	0.36
H_2O (%)	33.0	29.5	24.7	35.0	43.7	40.3	38.5
U_{total} (%)	0.05	n/r	0.04	0.04	n/r	0.04	0.11
^{90}Sr (μCi/g)	36.2	n/r	32.5	31.8	n/r	28.3	69.3
137Cs (μCi/g)	199	163	120	187	184	203	170
Total beta (μCi/g)	263	n/r	182	253	n/r	263	n/r
Total alpha (μCi/g)	0.06	0.01	0.05	0.06	0.01	0.04	n/r
TOC (%)	0.56	0.45	0.39	0.38	0.28	0.42	1.30
Bulk density (g/mL)	1.67	1.74	1.68	1.73	1.66	1.67	1.54

Note:

[1]Agnew et al. (1997)

Table C2-2 shows that the concentration of all indicator analyte values for the selected segments were >10 percent of the historical model estimates for the SMM saltcake in this tank.

In summary, all segments analyzed agree with A1 saltcake estimates and historical model predictions. Segments 1 to 10 are mostly saltcake solids that form a nonconvective layer in the top of the tank. Segments 11 to 14 are mostly drainable liquids with few solids that form a convective layer. The phenomenon of solids floating on a liquid layer is caused by gas voids observed within the solids layer. The bottom segment of the tank (segment 15) also passed the gateway analysis except for sulfate and chromium. The waste recovered for this segment does not appear to contain any of the SRR or PUREX high-level waste sludge heel expected at the bottom of the tank. However, only the upper 5 to 12 cm of segment 15 was retrieved because of a hard layer in the tank. It is still probable that an 11 kL heel of sludge is at the bottom of the tank.

C3.0 ANALYSIS FOR HYDROSTATIC HEAD FLUID CONTAMINATION

Water was used as a hydrostatic head fluid (HHF) in the acquisition of cores 226 and 228. Lithium bromide was added to the HHF to act as a tracer. Composite and segment analyses for lithium and bromide were performed in accordance with the sampling and analysis plan (Field et al. 1997) to detect contamination of the waste samples with HHF.

C3.1 LITHIUM

The sample results shown in Table C3-1 are for samples having lithium results that exceeded 100 μg/g. Because of probable incursion of HHF into these samples, bromide was requested as a secondary analysis.

Table C3-1. Tank 241-AX-101 Lithium Results.

Sample Number	Core:Segment Portion	Average Lithium
Solids		**(μg/g)**
S98T000088	226:1 lower half	652
S98T000648	228:7 liner liquid solid	2,860
S98T000774	228:11 lower half	155
Drainable liquid		**(μg/mL)**
S98T000568	228:1 liner liquid	1,830
S98T000645	228:7 liner liquid	1,720

C3.2 BROMIDE

Bromide analyses were reported for all samples shown in Table C3-1. Bromide results shown in Table C3-2 indicate the liner liquids in core 228, segments 1 and 7, were HHF fluid. Hydrostatic head fluid in these segments did not appear to intrude into the upper and lower half solid samples. The amount of HHF contamination in core 226, segment 1, and core 228, segment 11, solids samples was determined using the approach outlined in Winkelman (1996). Corrected water content for each of these samples is shown in Table C3-3. The results indicate that HHF intrusion was significant (< 10% of total water content) for these samples.

Table C3-2. Tank 241-AX-101 Bromide Results

Sample Number	Core:Segment Portion	Average Bromide
Solids		**(μg/g)**
S98T000089	226:1 lower half	3,750
S98T000650	228:7 liner liquid solid	21,900
S98T000776	228:11 lower half	1,380
Drainable liquid		**(μg/mL)**
S98T000568	228:1 liner liquid	25,700
S98T000645	228:7 liner liquid	24,500

Table C3-3. Correction to Thermogravimetric Analysis Results as a Result of Hydrostatic Head Fluid Contamination.

Core: Segment Portion	TGA Result (%)	Corrected TGA Result (%) (Based on Bromide)
Solids		
226:1 lower half	34.5	22.6
228:11 lower half	29.8	25.6

C4.0 APPENDIX C REFERENCES

Agnew, S. F., J. Boyer, R. A. Corbin, T. B. Duran, J. R. Fitzpatrick, K. A. Jurgensen, T. P. Ortiz, and B. L. Young, 1997, *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4*, LA-UR-96-3860, Rev. 0, Los Alamos National Laboratory, New Mexico.

Dukelow, G. T., J. W. Hunt, H. Babad, and J. E Meacham, 1995, *Tank Safety Screening Data Quality Objective*, WHC-SD-WM-SP-004, Rev. 2, Westinghouse Hanford Company, Richland, Washington.

Field, J. G., D. E. Place, and R. D. Cromar, 1997, *Tank Characterization Report for Single-Shell Tank 241-A-101*, HNF-SD-WM-ER-673, Rev. 0A, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

Simpson, B. C., and D. J. McCain, 1997, *Historical Model Evaluation Data Requirements*, WHC-SD-WM-DQO-118, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Winkelman, W. D., 1996, *Technical Basis and Spreadsheet Documentation for Correcting Waste Tank Core Samples for Water Intrusion Based on an LiBr Tracer*, WHC-SD-WM-CSWD-081, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

APPENDIX D

EVALUATION TO ESTABLISH BEST-BASIS INVENTORY FOR SINGLE-SHELL TANK 241-AX-101

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APPENDIX D

EVALUATION TO ESTABLISH BEST-BASIS INVENTORY FOR SINGLE-SHELL TANK 241-AX-101

An effort is underway to provide waste inventory estimates that will serve as standard characterization source terms for the various waste management activities (Hodgson and LeClair 1996). As part of this effort, an evaluation of available information for single-shell tank 241-AX-101 was performed, and a best-basis inventory was established. This work, detailed in the following sections, follows the methodology that was established by the standard inventory task.

D1.0 CHEMICAL INFORMATION SOURCES

Available waste (chemical) information for tank 241-AX-101 includes the following:

- Analytical data from January/February 1998 push core samples
- Analytical data from July 1997 grab samples
- Tank waste photographs
- Analytical data from other tanks containing SMMA1 waste
- The HDW model document (Agnew et al. 1997a) provides tank content estimates in terms of component concentrations and inventories.

D2.0 COMPARISON OF COMPONENT INVENTORY VALUES

Tables D2-1 and D2-2 show tank 241-AX-101 chemical and radionuclide inventories predicted from the HDW model estimates (Agnew et al. 1997a) and previous best basis estimates. The chemical species are reported without charge designation according to the best-basis inventory convention. No sample data was available at the time the previous best-basis inventory was prepared (effective May 31, 1997). As a result, estimates were based on process information for the SRR waste type and on analytical results for other tanks for the SMMA1 waste. The HDW model and previous best-basis inventory estimates were based on the same volume—2,831 kL (748 kgal).

Table D2-1. Comparison of Inventory Estimates for Nonradioactive Components in Tank 241-AX-101. (2 sheets)

Analyte	HDW[1] Inventory Estimate (kg)	Previous Best-Basis Estimate[2] (kg)
Al	1.16E+05	1.16E+05
Bi	654	669
Ca	3,240	6,570
Cl	21,100	21,100
Cr	15,400	5,810
F	3,260	3,260
Fe	8,370	2,160
Hg	5.08	0
K	6,470	9,620
La	7.86	7.86
Mn	645	471
Na	7.92E+05	7.93E+05
Ni	882	354
NO_2	2.91E+05	2.90E+05
NO_3	6.71E+05	4.31E+05
OH	4.16E+05	4.40E+05
Pb	718	1,380
PO_4	22,500	25,200
Si	7,530	42,500
SO_4	70,600	70,600
Sr	0	45.4
TIC as CO_3	79,100	79,200

Table D2-1. Comparison of Inventory Estimates for Nonradioactive Components in Tank 241-AX-101. (2 sheets)

Analyte	HDW[1] Inventory Estimate (kg)	Previous Best-Basis Estimate[2] (kg)
TOC	56,600	30,500
U_{TOTAL}	4,910	5,440
Zr	34.2	792

Notes:
[1]Agnew et al. (1997a)
[2]Effective May 31, 1997 (LMHC 1998)

Table D2-2. Comparison of Inventory Estimates for Selected Radioactive Components in Tank 241-AX-101.

Analyte	HDW[1] Inventory Estimate (Ci)	Previous Best Basis Estimate[2] (Ci)
^{14}C	98.7	9.82
^{60}Co	126	125
^{90}Sr	1.02E+06	2.63E+05
^{99}Tc	753	444
^{129}I	1.45	0.0370
^{137}Cs	7.54E+05	6.43E+05
^{241}Am	466	618
$^{239/240}Pu$	435	664

Notes:
[1]Agnew et al. (1997a), decayed to January 1, 1994
[2]Effective May 31, 1997 (LMHC 1998)

D3.0 COMPONENT INVENTORY EVALUATION

The following evaluation of tank contents is performed to identify potential errors and/or missing information that would influence the sample-based and HDW-model component inventories.

D3.1 WASTE HISTORY

Tank 241-AX-101 was put into service in 1965. Initial tank receipts included aged supernatant wastes, organic wash waste, and B Plant fission product waste. Typically, these wastes were received from other tanks rather than directly from the plants. Steam coils were added to the tank in 1966, and the tank was used to concentrate PUREX high-level waste, organic wash waste, and B Plant fission product additions. During 1968 and 1969, the tank was used to accumulate strontium and cesium recovery waste for staging to tank 241-A-102. The tank had little transfer activity until the end of 1973 when most of the supernatant was removed. PUREX sludge supernatant liquor was sent to the tank in 1973 and 1974. Pumping and sluicing of the tank contents for strontium and cesium recovery in 1975 and 1976 reduced the tank solids inventory to 4.5 kL (1.2 kgal) solids (Rodenhizer 1987). This value is lower than the HDW model estimate (11.4 kL [Agnew et al. 1997b]). However, both sources indicate the sludge layer in this tank is small.

After sluicing, tank 241-AX-101 received product slurry from the 242-A Evaporator (1976 through 1980). Several evaporator products were added to tank 241-AX-101 including evaporator bottoms, Hanford defense residual liquid, and double-shell slurry feed. The tank also received complexed waste. Appendix A contains additional detail on tank history and waste transfer history.

D3.2 CONTRIBUTING WASTE TYPES

Tables D3-1 and D3-2 compile known information about the types of solids accumulated in tank 241-AX-101. Waste solids in brackets are expected to have been removed when the tank was sluiced in 1976. The remaining heel is most likely SRR sludge.

Table D3-1. Expected Solids for Tank 241-AX-101.

Reference	Waste type
Anderson (1990)	[organic wash waste, fission product waste, B Plant waste, PUREX sludge supernatant], residual, double-shell slurry feed, complexed and noncomplexed waste
Hill et al. (1995)	Double-shell slurry feed, noncomplexed waste, evaporator feed
Agnew et al. (1997b)	[fission product waste, supernatant, organic waste, B Plant waste, PUREX low-level waste, PUREX sludge supernatant, SRR], evaporator feed, residual, double-shell slurry feed, complexed and noncomplexed waste
Agnew et al. (1997a)	SRR, PUREX neutralized high-level waste, SMMA1

Table D3-2. Hanford Defined Waste Model Solids for Tank 241-AX-101.

Hanford Defined Waste solids layer	kL	kgal
SRR	11.4	3
PUREX neutralized high-level waste	37.9	10
SMMA1	2,782	735

D3.3 EVALUATION OF SAMPLE AND PROCESS FLOWSHEET INFORMATION

D3.3.1 Saltcake Evaluation

Tank 241-AX-101 is unusual in that a solid saltcake layer is located above free liquid. Based on gamma scans, the solid/liquid interface is 3.6 m (11.8 ft) from the bottom of the tank. This equates to 1,359 kL (359 kgal) of SMMA1 solids and 1,461 kL (386 kgal) of free liquid waste. Sample extrusions indicated the presence of more solids in the tank, but this may have been a result of precipitation caused by cooling. As a result, the gamma scan results probably provide the best information for the solid liquid interface.

The best basis used for solid and free liquid A1 saltcake composition was the sample results. Tables D3-3 and D3-4 compare sample results for tank 241-AX-101 with results for tank 241-A-101, tank 241-A-103 and HDW model estimates for A1 saltcake (Agnew 1997a). In general, good correlation was observed among tank 241-AX-101 sample results, other sample results, and HDW model estimates.

Table D3-3. SMMA1 Nonradionuclide Composition Comparisons for Tank 241-AX-101. (2 sheets)

Analyte	241-AX-101		241-A-101		Tank 241-A-103	HDW Estimate for A1 Saltcake
	Solids (μg/g)[1]	Free Liquid (μg/mL)[1]	Solids (μg/g)[2]	Free Liquid (μg/mL)[2]	Solids (μg/g)[3]	(μg/g)
Al	23,100	53,600	24,700	44,600	16,570	31,700
B	98.5	52.3	104	47.1	22.3	n/r
Ba	<27.8	<27.0	<48.8	<27.2	575	n/r
Bi	<55.6	<53.9	<98.1	<54.3	176	790
Ca	241	<53.9	233	<54.3	1,716	1,200
Cl	3,820	9,560	3,890	7,980	n/r	2,160
TIC as CO_3	55,000	11,050	50,000	12,700	n/r	19,300
Cr	1,450	87.2	1,790	51.2	1,530	3,830
F	550	<85.2	479	<78.7	n/r	1,140
Fe	1,100	<27.0	343	<27.2	355	456
K	3,370	7,980	5,190	6,580	2,534	2,190
La	<27.8	<27.0	<49.0	<27.2	n/r	0
Mn	22.1	<5.39	34.0	<5.43	124	159
Na	2.05E+05	2.54E+05	2.06E+05	2.17E+05	208,605	2.33E+06
Ni	53.0	<10.8	64.9	<10.9	93.2	316
NO_2	86,400	1.62E+05	82,200	1.37E+06	n/r	75,200
NO_3	2.06E+05	1.49E+05	2.03E+05	1.36E+05	113,500	2.63E+06
Pb	79.6	149	<111	108	364	114
PO_4	5,760	3,060	6,520	3,330	n/r	21,100
Si	167	125	367	135	16,550	2,570
SO_4	14,100	2,200	12,700	1,290	n/r	20,800
Sr	<5.88	5.39	<9.81	<5.43	12.0	0
TOC	3,770	3,480	4,800	3,340	7,885	7,790

Table D3-3. SMMA1 Nonradionuclide Composition Comparisons for Tank 241-AX-101. (2 sheets)

Analyte	241-AX-101		241-A-101		Tank 241-A-103 Solids (μg/g)[3]	HDW Estimate for A1 Saltcake (μg/g)
	Solids (μg/g)[1]	Free Liquid (μg/mL)[1]	Solids (μg/g)[2]	Free Liquid (μg/mL)[2]		
U_{TOTAL}	394	269	394	<271	1,435	2,270
Zr	5.39	5.39	26.6	<5.66	209	105
Density	1.675	1.475	1.66	1.40	1.35	1.895

Notes:

[1]Mean of subsegment samples (see Appendix B3.4)
[2]Tank 241-A-101 tank characterization report (Field et al. 1997)
[3]Mean of composite core samples (Weiss and Schull 1988)

Table D3-4. SMMA1 Radionuclide Composition Comparisons for Tank 241-AX-101.

Analyte	241-AX-101		241-A-101		241-A-103 Solids (μCi/g)[3]	HDW SMMA1 Solids (μCi/g)
	Solids (μCi/g)[1]	Free Liquid (μCi/mL)[1]	Solids (μCi/g)[2]	Free Liquid (μCi/mL)[2]		
Total alpha	0.0406	0.0216	0.0483	<0.015	n/r	n/r
^{60}Co	0.0391	<0.0167[3]	<0.042	<0.01	0.033	0.0367
^{154}Eu	n/r	n/r	<0.15	<0.072	n/r	0.557
^{155}Eu	n/r	n/r	<0.43	<0.26	n/r	0.232
$^{89/90}$Sr	11.9	0.265[3]	14.2	0.075	40.5	88.4
^{137}Cs	200	n/r[3]	202	365	169	151
$^{239/240}$Pu	n/r	<2.23E-04[4]	n/r	<2.1E-04	0.130	0.0561
^{241}Am	n/r	<3.96E-04[4]	<0.076	<3.9E-04	0.120	0.0304
^{14}C	n/r	n/r	n/r	n/r	0.0026	0.0252
^{99}Tc	n/r	n/r	n/r	n/r	0.117	0.123
^{129}I	n/r	n/r	n/r	n/r	9.50E-06	0.00024

Notes:

[1]Mean of subsegment samples (see Appendix B3.4)
[2]Tank 241-A-101 tank characterizaton report (Field et al. 1997)
[3]Mean of composite core samples (Weiss and Schull 1988)
[4]Tank 241-AX-101 1997 grab sample data (see Appendix B)

D3.3.2 Sludge Layer Evaluation

Although the push core sampler was unable to penetrate to the bottom of the tank, process knowledge indicates that a sludge heel exists at the bottom of the tank. The composition and inventory of the sludge heel was estimated based on HDW model estimates for the SRR waste type (see Tables D3-5 and D3-6).

Table D3-5. Estimated Inventory of Strontium Recovery Sludge Nonradioactive Components in Tank 241-AX-101 Waste Sludge.

Analyte	SRR sludge concentration ($\mu g/g$)[1]	SRR projected inventory (kg)[2]
Al	0	0
Bi	0	0
Ca	4,150	62.5
Cl	1,440	21.7
TIC as CO_3	15,500	233
Cr	0	0
F	0	0
Fe	54,000	813
K	345	5.19
La	0	0
Mn	0	0
Na	1.12E+05	1,690
NO_2	19,400	292
NO_3	0.0182	2.73 E-04
Pb	0	0
PO_4	0	0
Si	0	576
SO_4	38,300	96.0
Sr	0	0
TOC	39,800	599
U_{TOTAL}	62.4	0.939
Zr	0	0
Ni	0	0
Density	1.32 g/mL	-

Notes:

[1] Composition based on HDW (Agnew et al. 1997a)

[2] Based upon a volume of 11.4 kL (3 kgal) of sludge and 1.32 g/mL density in tank 241-AX-101.

Table D3-6. Estimated Inventory of Strontium Recovery Sludge Radioactive Components in Tank 241-AX-101 Waste Sludge (Decayed to January 1, 1994).

Analyte	Average SRR Sludge Concentration (μCi/g)[1]	SRR Projected Inventory (Ci)[2]
^{90}Sr	7,240	1.09E+05
$^{239/240}$Pu	11.5	173
^{241}Am	10.9	164
^{60}Co	0.0104	0.156
^{137}Cs	134	2,016
^{154}Eu	5.65	85.0
^{155}Eu	14.7	221
^{14}C	0.00512	0.077
^{99}Tc	0.0346	0.521
^{129}I	6.72E-05	0.00101

Notes:

[1] Composition based on HDW.

[2] Based on a volume of 11.4 kL 93 kgal) of sludge and 1.32 g/mL density in tank 241-AX-101.

D3.4 DOCUMENT ELEMENT BASIS

The chemical and radionuclide inventory of tank 241-AX-101 can be estimated from the mean laboratory analyses for the two core samples, the total waste volume (2,831 kL [748 kgal]), the volume of the sludge heel remaining after sluicing (11.4 kL [3 kgal]), and the calculated volumes of solid/liquid material.

The tank inventory is the sum of the components in the sludge, free liquid, and saltcake. The resulting inventories are provided in Tables D3-7 and D3-8. The inventories estimated by the Agnew et al. (1997a) are included for comparison.

Table D3-7. Estimated Chemical Inventory for Tank 241-AX-101.

Analyte	Sludge Layer Inventory (kg)[1]	Free Liquid Inventory (kg)[2]	Saltcake Inventory (kg)[3]	Sample-Based 241-AX-101 Inventory (kg)	HDW Model Inventory 241-AX-101 (kg)
Al	0	78,300	45,300	1.24E+05	1.16E+05
Bi	0	<79.3	<127	0	654
Ca	62.5	<79.3	549	690	3,240
Cl	21.7	14,000	8,700	22,700	21,100
TIC as CO_3	233	16,200	125,000	1.42E+05	79,100
Cr	0	127	3,300	3,430	15,400
F	0	124	1,250	1,380	3,260
Fe	813	39.5	2,500	3,360	8,370
K	5.19	11,700	7,670	19,300	6,470
La	0	<39.5	<63.3	0	7.86
Mn	0	<7.87	<50.3	0	645
Na	1,690	3.71E+05	4.67E+05	8.39E+05	7.92E+05
Ni	0	<15.8	<121	0	882
NO_2	292	2.37E+05	1.97E+05	4.34E+05	2.91E+05
NO_3	2.74E-04	2.18E+05	4.69E+05	6.87E+05	6.71E+05
Pb	0	218	181	399	718
PO_4	0	4,470	13,100	17,600	22,500
SO_4	96.0	3,214	32,100	35,900	70,600
Si	576	183	380	563	7,530
Sr	0	<7.87	<13.4	0	0
TOC	599	5,080	8,580	14,300	13,000
U_{TOTAL}	0.939	393	897	1,290	4,910
Zr	0	<7.87	12.3	0	20.1

Notes:

[1]Based on 11.4 kL (3 kgal) volume and 1.32 g/mL density.
[2]Based on 1,359 kL (359 kgal) volume and 1.475 specific gravity.
[3]Based on 1,461 kL (386 kgal) volume and 1.675 g/mL density.

Table D3-8. Estimated Radionuclide Inventory for Tank 241-AX-101. (2 sheets)

Analyte	Sludge Layer Inventory (Ci)[1]	Free Liquid Inventory (Ci)[2]	Saltcake Inventory (kg)[3]	Sample-Based 241-AX-101 Inventory (Ci)	HDW Model Inventory 241-AX-101 (Ci)
^{241}Am	164	0.58	273	438	466
^{137}Cs	2,020	2.95E+05	4.55E+05	7.52E+05	7.54E+05
^{60}Co	0.156	24.4	89.0	114	126
^{154}Eu	85.0	105	341	532	2,300
^{155}Eu	221	380	979	1,580	1,360
$^{239/240}$Pu	176	0.33	296	472	435
^{90}Sr	1.09E+05	387	27,100	1.36E+05	1.02E+06
^{14}C	0.077	n/r	5.92	6.00	98.7
^{99}Tc	0.521	n/r	266	267	753
^{129}I	0.00101	n/r	0.02	0.02	1.45

Analyte	Sludge Layer Inventory (Ci)[1]	241-AX-101 SMM Inventory[4]	Total Inventory (Ci)	HDW Model Inventory 241-AX-101 (Ci)
^{3}H	0.944	619	620	625
^{59}Ni	6.94	4.94	11.9	16.3
^{63}Ni	683	486	1,170	1,620
^{79}Se	3.87	9.60	13.5	17.7
^{93m}Nb	14.3	33.9	48.3	62.8
^{93}Zr	16.7	47.4	64.1	83.4
^{106}Ru	0.0299	0.0219	0.05	0.0662
^{113m}Cd	35.7	262	298	381
^{125}Sb	0.919	561	562	568
^{126}Sn	6.21	14.5	20.7	27.3
^{134}Cs	0.111	10.9	11.0	11.3
^{151}Sm	14500	33,700	48,200	63,900
^{152}Eu	3.61	13.0	16.6	21.4
^{226}Ra	0.000466	3.62E-04	8.29E-04	0.00111
^{227}Ac	0.00241	0.00225	0.00466	0.00617

Table D3-8. Estimated Radionuclide Inventory for Tank 241-AX-101. (2 sheets)

Analyte	Sludge Layer Inventory (Ci)[1]	241-AX-101 SMM Inventory[4]	Total Inventory (Ci)	HDW Model Inventory 241-AX-101 (Ci)
^{228}Ra	2.11E-09	1.02	1.02	1.02
^{229}Th	3.52E-07	0.0235	0.0235	0.0235
^{231}Pa	0.00361	0.0110	0.0146	0.0180
^{232}Th	2.859E-11	0.110	0.110	0.110
^{237}Np	0.00164	2.59	2.591	2.60

Notes:

[1]Based on 11.4 kL (3 kgal) volume and 1.32 g/mL density
[2]Based on 1,359 kL (359 kgal) volume and 1.475 specific gravity
[3]Based on 1,461 kL (386 kgal) volume and 1.675 g/mL density
[4]SMM inventory for tank 241-AX-101 (Agnew et al. 1997a)

This section compares the sample-based inventory estimate for tank 241-AX-101 with the inventory estimate calculated by the HDW model. The tank 241-AX-101 inventories predicted by the HDW model, and the inventories based on core sample analyses are in excellent agreement for the major components (Al, Na, and NO_3), and reasonably good for most other species.

Aluminum. The HDW model predicts an aluminum inventory which is only 6.5 percent less than that predicted from the analytical data.

Carbonate. The sample-based inventory is about 1.8 times higher than the HDW model inventory. The hydroxide ion in Hanford Site waste tanks is converted to carbonate by the absorption of carbon dioxide from the ambient air. One mole of absorbed carbon dioxide will react with two moles of hydroxide ion to form one mole of carbonate ion. The rate is difficult to model at best and is accelerated by use of the airlift circulators that were installed in many Hanford Site underground storage tanks. Because the hydroxide concentration was not measured for the solids materials in tank 241-AX-101 core samples, an overall hydroxide/carbonate comparison is not possible. However, conversion of the 416,000 kg of the hydroxide to carbonate, which was predicted by the HDW model, may account for differences in the carbonate inventories.

Fluoride. The HDW model fluoride inventory is 2.4 times that determined from the sample results. This may be the result of assuming too high a fluoride solubility in tanks that originally received wastes containing fluorides. Consequently, the fluoride concentration in the supernatants, which became evaporator feed, is overestimated by the HDW model.

Iron. The HDW model iron inventory is 2.5 times higher than the inventory based on tank 241-AX-101 core samples. Part of this difference is the result of the HDW model assumption that the sludge heel after tank sluicing in 1976 was equivalent to PUREX high-level waste. The sludge heel was sampled in 1976 (Burch 1976), and the heel was found to include insoluble minerals that had formed in the tank waste.

Nitrate. The nitrate inventory predicted by the HDW model is only 2.3 percent less than the sample-based nitrate inventory.

Phosphate. The HDW model inventory for phosphate is only 28 percent higher than that determined from the core samples.

Sodium. The predicted HDW sodium inventory is only 5.6 percent lower than that calculated from core samples.

Sulfate. The HDW model sulfate inventory is 2 times higher than the inventory determined from core sample analyses. The HDW model assumes a sodium sulfate solubility of 0.35*M*, which is not unreasonable for solutions with high sodium ion concentrations. The HDW model global sulfate inventory is less than that predicted by the standard inventory task (Kupfer et al. 1997). The HDW model has apparently incorrectly distributed sulfate to the evaporator feed during the production of the tank 241-AX-101 salt slurry.

Total Hydroxide. Once the best-basis inventories were determined, the hydroxide inventory was calculated by performing a charge balance with the valences of other analytes. This charge balance approach is consistent with that used by Agnew et al. (1997). The total hydroxide inventory based on core sample analyses is 4.65E+04 kg, which is 10.5 percent greater than the HDW model estimate.

Cesium-137 and Strontium-90. The HDW model ^{90}Sr inventory is 7.5 times higher than the sample-based inventory. One possible explanation for the differences is that the tank supernatants were often pumped out a few days after slurry receipt, and the solids containing ^{90}Sr may not have had time to settle. Another possibility is that the strontium was held in solution by dilute complexant concentrations and was pumped out with the supernatants. The HDW model ^{137}Cs inventory is only 0.3 percent higher than the sample-based inventory.

Analytical Methods. All chemical analyses for the solid material in the two core samples were made on acid digested samples. Caustic fusion sample preparations were performed only for radionuclides. Caustic fusion sample preparation generally dissolves a larger fraction of relatively insoluble materials. The comparison of tank 241-AX-101 and tank 241-A-101 analytical results with tank 241-A-103 results (which included caustic fusion sample preparation) suggests that some minor components (Ca, Mn, Si, U, and Zr) may be under reported because the less rigorous acid digestion was used for sample preparation.

D4.0 DEFINE THE BEST-BASIS AND ESTABLISH COMPONENT INVENTORIES

Information about chemical, radiological, and/or physical properties is used to perform safety analyses, engineering evaluations, and risk assessment associated with waste management activities, as well as regulatory issues. These activities include overseeing tank farm operations and identifying, monitoring, and resolving safety issues associated with these operations and with the tank wastes. Disposal activities involve designing equipment, processes, and facilities for retrieving wastes and processing them into a form that is suitable for long-term storage/disposal.

Chemical and radiological inventory information are generally derived using three approaches: 1) component inventories are estimated using the results of sample analyses, 2) component inventories are predicted using the HDW model based on process knowledge and historical information, or 3) a tank-specific process estimate is made based on process flowsheets, reactor fuel data, essential material usage, and other operating data.

An effort is underway to provide waste inventory estimates that will serve as standard characterization source terms for various waste management activities (Hodgson and LeClair 1996). As part of this effort, an evaluation of chemical information for tank 241-AX-101 was performed.

The evaluation included the following information:

- Two core samples obtained in January/February 1998
- Grab samples obtained in July 1997
- Tank 241-A-101 and tank 241-A-103 sample results
- HDW model estimates for total tank inventory, SRR waste composition, SMM inventory in tank 241-AX-101, and SMMA1 composition (Agnew et al. 1997a)

Based on this evaluation, a best-basis inventory was developed for tank 241-AX-101 (see Tables D4-1 and D4-2). Samples results were used as the best basis for SMMA1 waste. Two distinct layers were apparent from sample results: an upper solid (nonconvective) layer and a lower liquid (convective) layer. Because no sludge was recovered by push core sampling, HDW model estimates for the SRR waste type were used to estimate the inventory of the sludge heel at the bottom of the tank. The total inventory is a combination of these two assessments. The sample based/engineering assessment was chosen as the best basis for analytes for which sample data was available. Hanford defined waste model inventory values were used for analytes for which sample values and engineering assessment estimates were not available. Engineering assessment values were selected for trace analytes with little supporting sample data. The inventory values reported in Tables D4-1 and D4-2 are subject to change. For the most current inventory values, refer to the Tank Characterization Database (LMHC 1998).

Best-basis tank inventory values are derived for 46 key radionuclides (as defined in Section 3.1 of Kupfer et al. 1997), all decayed to a common report date of January 1, 1994. Often waste sample analyses have only reported ^{90}Sr, ^{137}Cs, $^{239/240}Pu$, and total uranium (or total beta and total alpha), while other key radionuclides such as ^{60}Co, ^{99}Tc, ^{129}I, ^{154}Eu, ^{155}Eu, and ^{241}Am, have been infrequently reported. For this reason, it has been necessary to derive most of the 46 key radionuclides by computer models. These models estimate radionuclide activity in batches of reactor fuel, account for the split of radionuclides to various separations plant waste streams, and track their movement with tank waste transactions. These computer models are described in Kupfer et al. 1997, Section 6.1, and in Watrous and Wootan 1997. Model-generated values for radionuclides in any of 177 tanks are reported in Agnew et al. (1997a). The best-basis value for any one analyte may be a model result or a sample or engineering assessment-based result, if available.

Tables D4-1 and D4-2 show the best-basis inventory estimates for tank . The inventory values are subject to change. For the most current inventory values, refer to the Tank Characterization Database (LMHC 1998).

Table D4-1. Best-Basis Inventory Estimates for Nonradioactive Components in Tank 241-AX-101 (Effective March 31, 1998). (2 sheets)

Analyte	Total Inventory (kg)	Basis (S, M, E or C)[1]	Comment
Al	1.24E+05	S/E	
Bi	0	E	Sample results less than detect
Ca	690	S/E	
Cl	22,700	S/E	
TIC as CO_3	1.42E+05	S/E	
Cr	3,430	S/E	
F	1,380	S/E	
Fe	3,360	S/E	
Hg	0	E	Simpson (1998)
K	19,300	S/E	
La	0	E	Sample results less than detect
Mn	0	E	Sample results less than detect
Na	8.39E+05	S/E	

Table D4-1. Best-Basis Inventory Estimates for Nonradioactive Components in Tank 241-AX-101 (Effective March 31, 1998). (2 sheets)

Analyte	Total Inventory (kg)	Basis (S, M, E or C)[1]	Comment
Ni	0	E	Sample results less than detect
NO_2	4.34E+05	S/E	
NO_3	6.87E+05	E	
OH_{TOTAL}	4.00E+05	C	Charge balance calculation
Pb	399	S/E	
PO_4	17,600	S/E	IC result
SO_4	35,900	S/E	IC result
Si	563	S/E	
Sr	21.3	S/E	Sample results less than detect
TOC	14,300	S/E	
U_{TOTAL}	1,290	S/E	
Zr	0	E	Sample results less than detect

Note:

[1]S = sample-based (see Appendix B), M = HDW model-based (Agnew et al. 1997a), E = engineering assessment-based, and C = calculated by charge balance; includes oxides as hydroxides, not including CO_3, NO_2, NO_3, PO_4, SO_4, and SiO_3.

Table D4-2. Best-Basis Inventory Estimates for Radioactive Components in Tank 241-AX-101 Decayed to January 1, 1994 (Effective March 31, 1998). (3 sheets)

Analyte	Total Inventory (Ci)	Basis (S, M, or E)[1]	Comment
^{3}H	620	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{14}C	6.00	E	Tank 241-A-103 core and SRR
^{59}Ni	11.9	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{60}Co	114	S/E	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{63}Ni	1,170	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{79}Se	13.5	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids

Table D4-2. Best-Basis Inventory Estimates for Radioactive Components in Tank 241-AX-101 Decayed to January 1, 1994 (Effective March 31, 1998). (3 sheets)

Analyte	Total Inventory (Ci)	Basis (S, M, or E)[1]	Comment
^{90}Sr	1.36E+05	S/E	
^{90}Y	1.36E+05	S/E	Calculated from parent
^{93m}Nb	48.3	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{93}Zr	64.1	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{99}Tc	267	E	Tank 241-A-103 core and SRR
^{106}Ru	0.050	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{113m}Cd	298	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{125}Sb	562	E/M	
^{126}Sn	20.7	E/M	
^{129}I	0.02	E	Tank 241-A-103 core and SRR
^{134}Cs	11.0	E/M	
^{137}Cs	7.52E+05	S/E	
^{137m}Ba	7.11E+05	S/E	Calculated from parent
^{151}Sm	48,200	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{152}Eu	16.6	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{154}Eu	532	E	Tank 241-AX-101 grab
^{155}Eu	1,580	E	Tank 241-AX-101 grab
^{226}Ra	8.29E-04	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{227}Ac	0.00466	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{228}Ra	1.02	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{229}Th	0.0235	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{231}Pa	0.0146	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{232}Th	0.110	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids

Table D4-2. Best-Basis Inventory Estimates for Radioactive Components in Tank 241-AX-101 Decayed to January 1, 1994 (Effective March 31, 1998). (3 sheets)

Analyte	Total Inventory (Ci)	Basis (S, M, or E)[1]	Comment
^{232}U	0.789	S/E/M	Based on U_{TOTAL} ratioed to HDW model uranium isotopes
^{233}U	3.02	S/E/M	Based on U_{TOTAL} ratioed to HDW model uranium isotopes
^{234}U	0.484	S/E/M	Based on U_{TOTAL} ratioed to HDW model uranium isotopes
^{235}U	0.0192	S/E/M	Based on U_{TOTAL} ratioed to HDW model uranium isotopes
^{236}U	0.0156	S/E/M	Based on U_{TOTAL} ratioed to HDW model uranium isotopes
^{237}Np	2.59	E/M	Based on HDW SRR waste and SMM inventory for saltcake and liquids
^{238}Pu	14.0	E/M	Based on $^{239/240}Pu$ ratioed to HDW model alpha isotopes
^{238}U	0.431	S/E/M	Based on U_{TOTAL} ratioed to HDW model uranium isotopes
^{239}Pu	399	E/M	Based on $^{239/240}Pu$ ratioed to HDW model alpha isotopes
^{240}Pu	72.8	E	Based on $^{239/240}Pu$ ratioed to HDW model alpha isotopes
^{241}Am	438	E	Tank 241-A-103 core
^{241}Pu	987	E/M	Based on $^{239/240}Pu$ ratioed to HDW model alpha isotopes
^{242}Cm	0.660	S/M	Based on ^{241}Am ratioed to HDW model alpha isotopes
^{242}Pu	0.00566	E/M	Based on $^{239/240}Pu$ ratioed to HDW model alpha isotopes
^{243}Am	0.0179	S/M	Based on ^{241}Am ratioed to HDW model alpha isotopes
^{243}Cm	0.0590	S/M	Based on ^{241}Am ratioed to HDW model alpha isotopes
^{244}Cm	1.08	S/M	Based on ^{241}Am ratioed to HDW model alpha isotopes

Note:

[1]S = sample-based, M = HDW model-based (Agnew et al. 1997a), and E = engineering assessment-based.

D5.0 APPENDIX D REFERENCES

Agnew, S. F., J. Boyer, R. A. Corbin, T. B. Duran, J. R. FitzPatrick, K. A. Jurgensen, T. P. Ortiz, and B. L. Young, 1997a, *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4*, LA-UR-96-3860, Los Alamos National Laboratory, Los Alamos, New Mexico.

Agnew, S. F., R. A. Corbin, T. B. Duran, K. A. Jurgensen, T. P. Ortiz, and B. L. Young, 1997b, *Waste Status and Transaction Record Summary (WSTRS Rev. 4)*, LA-UR-97-311, Rev. 0, Los Alamos National Laboratory, Los Alamos, New Mexico.

Anderson, J. D., 1990, *A History of the 200 Area Farms*, WHC-MR-0132, Westinghouse Hanford Company, Richland, Washington.

Burch, G., 1976, *X-Ray Analysis of Sample 101A*, (internal letter [number, month and day unknown] to J. E. Horton), Atlantic Richfield Hanford Company, Richland, Washington.

Field, J. G., D. E. Place, and R. D. Cromar, 1997, *Tank Characterization Report for Single-Shell Tank 241-A-101*, HNF-SD-WM-ER-673, Rev. 0A, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

Hill, J. G., G. S. Anderson, and B. C. Simpson, 1995, *The Sort on Radioactive Waste Type Model: A Method to Sort Single-Shell Tanks into Characteristic Groups*, PNL-9814, Rev. 2, Pacific Northwest Laboratory, Richland, Washington.

Hodgson, K. M., and M. D. LeClair, 1996, *Work Plan for Defining a Standard Inventory Estimate for Wastes Stored in Hanford Site Underground Tanks*, WHC-SD-WM-WP-311, Rev. 1, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

Kupfer, M. J., A. L. Boldt, B. A. Higley, K. M. Hodgson, L. W. Shelton, B. C. Simpson, R. A. Watrous, S. L. Lambert, D. E. Place, R. M. Orme, G. L. Borsheim, N. G. Colton, M. D. LeClair, R. T. Winward, and W. W. Schulz, 1997, *Standard Inventories of Chemicals and Radionuclides in Hanford Site Tank Wastes*, HNF-SD-WM-TI-740, Rev. 0A, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford Inc., Richland, Washington.

LMHC, 1998, Best-Basis Inventory for Tank 241-AX-101, May 28, Tank Characterization Database, Internet at http://twins.pnl.gov:8001/TCD/main.html.

Rodenhizer, D. G., 1987, *Hanford Waste Tank Sluicing History*, WHC-SD-WM-TI-302, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Weiss, R. L., and K. E. Schull, 1988, *Data Transmittal Package for Tank 241-A-103 Waste Tank Characterization*, SD-RE-TI-201, Rev. 0, Rockwell Hanford Company, Richland, Washington.

Watrous, R. A., and D. W. Wootan, 1997, *Activity of Fuel Batches Processed Through Hanford Separations Plants, 1944 Through 1989,* HNF-SD-WM-TI-794, Rev. 0, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford Inc., Richland, Washington.

APPENDIX E

BIBLIOGRAPHY FOR TANK 241-AX-101

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APPENDIX E

BIBLIOGRAPHY FOR TANK 241-AX-101

Appendix E is a bibliography that supports the characterization of tank 241-AX-101. This bibliography represents an in-depth literature search of all known information sources that provide sampling, analysis, surveillance, modeling information, and processing occurrences associated with tank 241-AX-101 and its respective waste types.

The references in this bibliography are separated into three categories containing references broken down into subgroups. These categories and their subgroups are listed below.

I. NON-ANALYTICAL DATA

- Ia. Models/Waste Type Inventories/Campaign Information
- Ib. Fill History/Waste Transfer Records
- Ic. Surveillance/Tank Configuration
- Id. Sample Planning/Tank Prioritization
- Ie. Data Quality Objectives/Customers of Characterization Data

II. ANALYTICAL DATA - SAMPLING OF TANK WASTE AND WASTE TYPES

- IIa. Sampling of Tank 241-AX-101
- IIb. Sampling of 242-A Evaporator Streams

III. COMBINED ANALYTICAL/NON-ANALYTICAL DATA

- IIIa. Inventories Using Both Campaign and Analytical Information
- IIIb. Compendium of Existing Physical and Chemical Documented Data Sources

The bibliography is broken down into the appropriate sections of material with an annotation at the end of each reference describing the information source. Most information listed below is available in the Lockheed Martin Hanford Corporation Tank Characterization and Safety Resource Center.

I. NON-ANALYTICAL DATA

Ia. Models/Waste Type Inventories/Campaign Information

Anderson, J. D., 1990, *A History of the 200 Area Tank Farms*, WHC-MR-0132, Westinghouse Hanford Company, Richland, Washington.

- Contains single-shell tank fill history and primary campaign and waste type information up to 1981.

General Electric, 1955, *PUREX Technical Manual*, HW-31000, General Electric Hanford Company, Richland Washington.

- Contains PUREX process data and operating information about the sludge transferred to tank 241-A-101 in the 1950s.

Jungfleisch, F. M., and B. C. Simpson, 1993, *Preliminary Estimation of the Waste Inventories in Hanford Tanks Through 1980*, WHC-SD-WM-TI-057 Rev. 0A, Westinghouse Hanford Company, Richland, Washington.

- A model based on process knowledge and radioactive decay estimations using ORIGEN software for different compositions of process waste streams assembled for total, solution, and solids compositions per tank. Assumptions about waste,waste types, solubility parameters, and constraints are also given.

Schneider, K. J., 1951, *Flow Sheet and Flow Diagrams of Precipitation Separations Process*, HW-23043, General Electric Company, Richland, Washington.

- Contains compositions of first concentration cycle waste before transfer to Hanford Site East Area waste tanks.

Ib. Fill History/Waste Transfer Records

Agnew, S. F., R. A. Corbin, T. B. Duran, K. A. Jurgensen, T. P. Ortiz, and B. L. Young, 1997, *Waste Status and Transaction Record Summary (WSTRS) Rev. 4*, LA-UR-97-311, Rev. 0, Los Alamos National Laboratory, Los Alamos, New Mexico.

- Contains spreadsheets showing all available data on tank additions and transfers.

Anderson, J. D., 1990, *A History of the 200 Area Tank Farms*, WHC-MR-0132, Westinghouse Hanford Company, Richland, Washington.

- Contains single-shell tank fill history and primary campaign and waste information to 1981.

Ic. Surveillance/Tank Configuration

Alstad, A. T., 1993, *Riser Configuration Document for Single-Shell Waste Tanks*, WHC-SD-RE-TI-053, Rev. 9, Westinghouse Hanford Company, Richland, Washington.

- Shows tank riser locations in relation to a tank aerial view and a description of risers and their contents.

Estey, S. D., 1997, *Organic End State Analaysis of Tank 241-AX-101*, HNF-SD-WM-CN-124, Rev. 0, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Provides a record of the organic end state analysis of tank 241-AX-101.

Lipnicki, J., 1997, *Waste Tank Risers Available for Sampling*, HNF-SD-RE-TI-710, Rev. 4, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Assesses riser locations for each tank. Not all tanks are included or completed. An estimate of the risers available for sampling is also included.

Tran, T. T., 1993, *Thermocouple Status Single-Shell and Double-Shell Waste Tanks*, WHC-SD-WM-TI-553, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

- Contains riser and thermocouple information for Hanford Site waste tanks.

Id. Sample Planning/Tank Prioritization

Anderson, J. A. 1997, *Plan for Determining Breathing Rates in Single-Shell Tanks Using Tracer Gases*, HNF-SD-WM-TP-529, Rev. 3, SGN Eurisys Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Specifies requirements for injecting tracer gases in various tanks including tank 241-AX-101.

Brothers, J. W., 1997, *Sampling Plan for Tank 241-AX-101 Retained Gas Sampler Deployment*, (Letter TWS98.05 to R. E. Bauer, November 10), Pacific Northwest National Laboratory, Richland, Washington.

- Contains sampling and analysis requirements for RGS samples for tank 241-AX-101.

Blaak, T. M., 1997, *Request for Supernatant Samples from Tank 241-AX-101*, (internal memorandum PM# 2E97-047 to shift managers, July 10), Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Contains a request to obtain 1997 grab samples for tank 241-AX-101.

Brown, T. M., S. J. Eberlein, J. W. Hunt, and L. J. Fergestrom, 1997, *Tank Characterization Technical Sampling Basis*, HNF-SD-WM-TA-164, Rev. 3, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Summarizes the technical basis for characterizing tank waste and assigns a priority number to each tank.

DOE-RL, 1996, *Recommendation 93-5 Implementation Plan*, DOE/RL-94-0001, Rev. 1, U.S. Department of Energy, Richland Field Operations, Richland, Washington.

- Describes the organic solvents issue and other tank issues.

Field, J. G., 1997, *Tank 241-AX-101 Push Core Sampling and Analysis Plan*, WHC-SD-WM-TSAP-107, Rev. 1, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Contains sampling and analysis requirements for tank 241-AX-101 based on applicable DQOs.

Field, J. G., 1997, *Letter of Instruction for Non-Routine Analysis of Single-Shell Tank 241-AX-101 Grab Samples*, (internal memorandum 74620-97-215 to J. R. Jewett, September 5), Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Request for non-routine analysis of 1997 grab samples to assess salt crystal formation.

Grimes, G. W., 1977, *Hanford Long-Term Defense High-Level Waste Management Program Waste Sampling and Characterization Plan*, RHO-CD-137, Rockwell Hanford Operations, Richland, Washington.

- Early characterization planning document.

Homi, C. S., 1995, *Vapor Sampling and Analysis Plan*, WHC-SD-WM-TP-335, Rev.0G, Westinghouse Hanford Company, Richland, Washington.

- Vapor sampling and analysis procedure for 200 Area Tanks.

Sasaki, L. M., 1997, *Compatibility Grab Sampling and Analyis Plan for Fiscal Year 1997*, WHC-SD-WM-TSAP-115, Rev. 0G, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Contains sampling and analysis requirements for tank 241-AX-101 based on the compatibility DQO.

Winkelman, W. D., M. R. Adams, T. M. Brown, J. W. Hunt, D. J. McCain, and L. S. Fergestrom, 1997, *Fiscal Year 1997-1998 Waste Information Requirements Document*, HNF-SD-WM-PLN-126, Rev. 0A, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Contains Tri-Party Agreement requirement-driven TWRS Characterization Program information.

Winters, W. I., L. Jensen, L. M. Sasaki, R. L. Weiss, J. F. Keller, A. J. Schmidt, and M. G. Woodruff, 1989, *Waste Characterization Plan for the Hanford Site Single-Shell Tanks*, WHC-EP-0210, Westinghouse Hanford Company, Richland, Washington.

- Early version of characterization planning document.

Ie. Data Quality Objectives and Customers of Characterization Data

Bauer, R. E., and L. P. Jackson, 1997, *Data Quality Objective to Support Resolution of the Flammable Gas Safety Issue*, HNF-SD-WM-DQO-004, Rev. 3, DE&S Hanford, Inc. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Contains flammable gas requirements for single-shell tanks.

Dukelow, G. T., J. W. Hunt, H. Babad, and J. E. Meacham, 1995, *Tank Safety Screening Data Quality Objective*, WHC-SD-WM-SP-004, Rev. 2, Westinghouse Hanford Company, Richland, Washington.

- Determines whether tanks are under safe operating conditions.

Mulkey, L. M., and M. S. Miller, 1997, *Data Quality Objectives for Tank Farms Waste Compatibility Program*, WHC-SD-WM-DQO-001, Rev. 2, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Documents regulatory compatibility requirements for tank transfers.

Meacham, J. E., D. L. Banning, M. R. Allen, and L. D. Muhlestein, 1997, *Data Quality Objective to Support Resolution of the Organic Solvent Safety Issue*, HNF-SD-WM-DQO-026, Rev. 0, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Contains requirements for the organic solvents DQO.

Osborne, J. W., and L. L. Buckley, 1995, *Data Quality Objectives for Tank Hazardous Vapor Safety Screening*, WHC-SD-WM-DQO-002, Rev. 2, Westinghouse Hanford Company, Richland, Washington.

- Contains requirements for addressing hazardous vapor issues.

Schreiber, R. D., 1997, *Memorandum of Understanding for the Organic Complexant Issue Data Requirements*, HNF-SD-WM-RD-060, Rev. 0, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Contains requirements, methodology, and logic for analyses to support organic complexant issue resolution.

Simpson, B. C., and D. J. McCain, 1997, *Historical Model Evaluation Data Requirements*, WHC-SD-WM-DQO-018, Rev. 2, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Provides data needs for evaluating the Los Alamos National Laboratory model for estimating tank waste compositions.

II. ANALYTICAL DATA - SAMPLING OF TANK WASTE AND WASTE TYPES

IIa. Sampling of Tank 241-AX-101

ARCHO, 1973, *Tank 101-AX, Sample Number T6888, Date Sampled May 3, 1973* (unnumbered data sheet), Atlantic Richfield Company Hanford, Richland, Washington.

- Contains historical sample analysis results.

Brothers, J. W., 1998, *Preliminary Retained Gas Sampler Measurement Results for Hanford Waste Tank 241-AX-101*, (letter TWS98.37 to R. E. Bauer, November 10), Pacific Northwest National Laboratory, Richland, Washington.

- Contains preliminary analytical results for 1998 retained gas samples.

Caprio, G. S., 1995, *Vapor and Gas Sampling of Single-Shell tank 241-AX-101 Using the Vapor Sampling System*, WHC-SD-WM-RPT-170, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

- Contains analytical results from the June 1995 vapor sampling event.

Esch, R. A., 1998, *Tank 241-AX-101, Core 226 and 228, Analytical Results for the Final Report*, HNF-SD-WM-DP-300, Rev. 0, Waste Managment Federal Services of Hanford Inc. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Contains 1998 push core sample analytical results.

Esch, R. A., 1997, *Loss of Settled Solids from Tank 241-AX-101 Grab Samples*, (internal memorandum WMH-9758780 to K. M. Hall, September 25), Waste Management Federal Services of Hanford for Fluor Daniel Hanford, Inc., Richland, Washington.

- Documents loss of 1995 grab sample solids and corrective actions.

Esch, R. A., 1997, *Tank 241-AX-101, Grab samples, 1AX-97-1 through 1AX-97-3 Analytical Results for the Final Report*, HNF-SD-WM-DP-268, Rev. 0, Waste Management Federal Services of Hanford, Inc. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Contains analytical results for 1997 compatibility grab samples.

Field, J. G, 1998, *Immediate Notification: High Differential Scanning Calorimetry Exotherm for Tank 241-AX-101*, (internal memorandum 7A120-98-012 to C. B. Bryan, April 2), Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Notification of high exotherms in tank samples.

Herting, D. L., and M. T. Jansky, 1980, *Hot Boildown of Tank 101-AX Waste*, (internal memorandum 65453-80-201 to D. E. Bowers and M. C. Teats, July 18), Rockwell International, Richland, Washington.

- Contains analytical results for historical grab samples.

Hodgson, K. M., R. P. Anantatmula, S. A. Barker, K. D. Fowler, J. D. Hopkins, J. A. Lechelt, D. A. Reynolds, J. D. Bingham, and D. C. Hedengren, 1998, *Evaluation of Hanford Tanks for Trapped Gas*, WHC-SD-WM-ER-526, Rev. 1D, Westinghouse Hanford Company, Richland, Washington.

- Documents flammable gas classes for Hanford Site tanks.

Horton, J. E., 1975, *Analysis and Characterization of 101-AX Tank Sludge and Supernatant Liquid*, (internal memorandum, no number, to O. R. H. Rasmussen, August 4), Atlantic Richfield Company Hanford, Richland, Washington.

- Contains analytical results for historical sludge and supernatant samples.

Horton, J. E., 1975, *Corrected Analysis of PAS*, (internal memorandum, no number, to O. R. H. Rasmussen, August 18), Atlantic Richfield Company Hanford, Richland, Washington.

- Contains corrections to historical sample analyses presented in the August 4 letter.

Horton, J. E., 1976, *Analysis of 101-AX Tank Residual Sludges*, (internal memorandum, no number, to J. W. Bailey, October 26), Atlantic Richfield Company Hanford, Richland, Washington.

- Contains analytical results for SRR tank heel.

Horton, J. E., 1976, *Engineering Assistance*, (internal memorandum, no number, to D. C. Lini, November, no day), Atlantic Richfield Company Hanford, Richland, Washington.

- Contains analytical results for historical sludge samples.

Jansky, M. T., 1980, *Tank 101AX Waste Characteristics*, (internal memorandum 65453-80-331 to M. C. Teats, November 11), Rockwell International, Richland, Washington.

- Contains analytical results for 242-A Evaporator grab samples.

Jansky, M. T., 1980, *Composition of Waste from Tank 101AX*, (internal memorandum 65453-80-293 to D. E. Bowerd and D. A. Reynolds, October 7), Rockwell International, Richland, Washington.

- Contains analytical results for 242-A Evaporator grab samples.

Jansky, M. T., 1980, *101 AX Boildown*, (internal memorandum 65453-80-233 to M. C. Teats, August 19), Rockwell International, Richland, Washington.

- Contains analytical results and boildown test results for grab samples .

Jansky, M. T., and S. B. Wilson-Wright, 1980, *Decomposition of Complexants*, (internal memorandum 65453-080-174 to H. J. Eding, June 12), Rockwell International, Richland, Washington.

- Contains analytical results for grab samples and results of laboratory studies to decompose salt crystals.

Jansky, M. T., 1981, *Pu and Am Analysis of Various Tank Farm Samples*, (internal memorandum 65453-81-184 to J. S. Schofield, May 26), Rockwell International, Richland, Washington.

- Contains plutonium and americium results for grab samples.

Koegler, S. S., 1976, *A and AX Tank Sludge Heat Generation Rates*, (internal memorandum [no number] to R. E. Felt, February 12), Atlantic Richfield Company Hanford, Richland, Washington.

- Contains strontium and cesium sample results and heat generation estimates.

Pool, K. H., T. W. Clauss, J. C. Evans, B. D. McVeety, B. L. Thomas, K. B. Olsen, J. S. Fruchter, and K. L. Silvers, 1996, *Headspace Vapor Characterization of Hanford Waste Tank AX-101: Results from Samples Collected on 6/15/95*, PNNL-10878, Pacific Northwest National Laboratory, Richland, Washington.

- Contains analytical results for headspace vapor samples collected in June 1995.

Wheeler, R. E., 1975, *Analysis of Tank Farm Samples, Sample T-4809 Tank 101-AX, Received May 27, 1975* (internal memorandum to R. L. Walser, October 2), Atlantic Richfield Company Hanford, Richland, Washington.

- Contains historical sample analysis resutls.

IIb. Sampling 242 A-Evaporator Waste Streams

Field, J. G., 1997, *Tank Characterization Report for Single-Shell Tank 241-A-101*, HNF-SD-WM-ER-673, Rev. 0A, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Contains information on SMMA1 waste types.

Higley, B. A., and J. G. Field, 1997, *Preliminary Tank Characterization Report for Single-Shell Tank 241-A-103: Best-Basis Inventory*, HNF-SD-WM-ER-709, Rev. 0, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc. Richland, Washington.

- Contains information on SMMA1 waste types.

Winward, R. T., and M. J. Kupfer, 1997, *Preliminary Tank Characterization Report for Single-Shell Tank 241-A-106: Best-Basis Inventory*, HNF-SD-WM-ER-721, Rev. 0, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Contains information on SMMA1 waste types.

Each of the following references contains analytical results for grab samples taken for the 241-AX Evaporator-Crystallizer campaign specified in the document title. This waste was transferred to tank 241-AX-101 between 1976 and 1980.

Bendixsen, R. B., 1980, *Dilute Customer Waste Concentration First Pass 242-A Evaporator-Crystallizer Campaign 80-1, October 10 to October 20, 1979*, RHO-CD-80-1045-1, Rockwell Hanford Operations, Richland, Washington.

Bendixsen, R. B., 1980, *Dilute Waste Concentration 242-A Evaporator-Crystallizer Campaign 80-2, October 28 to November 11, 1979*, RHO-CD-80-1045-2, Rockwell Hanford Operations, Richland, Washington.

Bendixsen, R. B., 1980, *Customer Waste Concentration 242-A Evaporator-Crystallizer Campaign 80-3, November 15 to December 22*, 1979, RHO-CD-80-1045-3, Rockwell Hanford Operations, Richland, Washington.

Bendixsen, R. B., 1980, *Reconcentration of Second PN Campaign Wastes 242-A Evaporator-Crystallizer Campaign 80-5, March 12 to April 4, 1980*, RHO-CD-80-1045-5, Rockwell Hanford Operations, Richland, Washington.

Bendixsen, R. B., 1980, *Defense Waste Vitrification Demonstration Waste Concentration 242-A Evaporator-Crystallizer Campaign 80-4, February 21 to March 1, 1980*, RHO-CD-80-1045-3, Rockwell Hanford Operations, Richland, Washington.

Brown, G. E., 1979, *Hot Boildown of Cross-Site Transfer Waste*, (internal letter 60120-79-011 to K. G. Carothers, January 18), Rockwell Hanford Company, Richland, Washington.

Teats, M. C., 1981, *Dilute Complexed Waste Concentration 242-A Evaporator-Crystallizer Campaign 80-6, April 10 to April 27, 1980*, RHO-CD-80-1045-6, Rockwell Hanford Operations, Richland, Washington.

Teats, M. C., 1982, *242-A Evaporator Campaign 80-10 Post Run Letter*, SD-WM-PE-006 (revision number unknown), Rockwell Hanford Operations, Richland, Washington.

Teats, M. C., 1982, *242-A Evaporator Campaign 80-10 Post Run Letter*, SD-WM-PE-007 (revision number unknown), Rockwell Hanford Operations, Richland, Washington.

III. COMBINED ANALYTICAL/NON-ANALYTICAL DATA

IIIa. Inventories from Campaign and Analytical Information

Agnew, S. F., J. Boyer, R. A. Corbin, T. B. Duran, J. R. Fitzpatrick, K. A. Jurgensen, T. P. Ortiz, and B. L. Young, 1997, *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4*, LA-UR-96-3860, Rev. 0, Los Alamos National Laboratory, Los Alamos, New Mexico.

- Contains waste type summaries and primary chemical compound/analyte and radionuclide estimates for sludge, supernatant, and solids.

Allen, G. K., 1976, *Estimated Inventory of Chemicals Added to Underground Waste Tanks, 1944 - 1975*, ARH-CD-601B, Atlantic Richfield Company Hanford, Richland, Washington.

- Contains major components for waste types and some assumptions. Purchase records are used to estimate chemical inventories.

Allen, G. K., 1975, *Hanford Liquid Waste Inventory as of September 30, 1974*, ARH-CD-229, Atlantic Richfield Company Hanford, Richland, Washington.

- Contains major components for waste types, and some assumptions

Brevick, C. H., R. L. Newell, and J. W. Funk, 1997, *Historical Tank Content Estimate for the Northeast Quadrant of the Hanford 200 Areas*, WHC-SD-WM-ER-349, Rev. 1B, Fluor Daniel Northwest, Inc. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Contains summary information from the supporting document as well as in-tank photograph collages and the solid composite inventory estimates.

Klem, M. J., 1990, *Total Organic Carbon Concentration of Single-Shell Tank Waste* (internal letter 82316-90-032 to R. E. Raymond on April 27), Westinghouse Hanford Company, Richland, Washington.

- Provides a list of total organic carbon concentration for many tanks.

Schmittroth, F. A., 1995, *Inventories for Low-Level Tank Waste*, WHC-SD-WM-RPT-164, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

- Contains tank inventory information.

IIIb. Compendium of Data from Other Physical and Chemical Sources

Barker, S. A., 1998, *Response to Potential Inadequacy in the Authorization Basis for Tank 241-AX-101* (internal letter 7A140-98-041 to K. M. Hodgson, July 1), Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Contains data based evaluation to reclassify tank 241-AX-101 as a flammable gas Group 2 tank.

Brevick, C. H., J. L. Stroup, and J. W. Funk, 1997, *Supporting Document for the Historical Tank Content Estimate for AX Farm*, WHC-SD-WM-ER-308, Rev. 1B, Westinghouse Hanford Company, Richland, Washington.

- Contains historical data and solid inventory estimates.

Brevick, C. H., L. A. Gaddis, and E. D. Johnson, 1995, *Tank Waste Source Term Inventory Validation, Vol I & II.*, WHC-SD-WM-ER-400, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

- Contains a quick reference to sampling information in spreadsheet or graphical form for 23 chemicals and 11 radionuclides for all tanks.

De Lorenzo, D. S., J. H. Rutherford, D. J. Smith, D. B. Hiller, and K. W. Johnson, 1994, *Tank Characterization Reference Guide*, WHC-SD-WM-648, Rev. 0A, Westinghouse Hanford Company, Richland, Washington.

- Provides a broad background of information about the characterization of Hanford Site tank wastes.

Hanlon, B. M., 1997, *Waste Tank Summary Report for Month Ending March 31, 1998*, WHC-EP-0182-120, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Contains a monthly summary of the following: fill volumes, Watch List tanks, occurrences, integrity information, equipment readings, equipment status, tank location, and other miscellaneous tank information.

Hill, J. G., G. S. Anderson, and B. C. Simpson, 1995, *The Sort on Radioactive Waste Type Model: A Method to Sort Single-Shell Tanks into Characteristic Groups*, PNL-9814, Rev. 2, Pacific Northwest Laboratory, Richland, Washington.

- Describes a system of sorting single-shell tanks into groups based on the major waste types contained in each tank.

Husa, E. I., 1993, *Hanford Site Waste Storage Tank Information Notebook*, WHC-EP-0625, Westinghouse Hanford Company, Richland, Washington.

- Contains in-tank photographs and summaries of the tank description, leak detection system, and tank status.

Husa, E. I., 1995, *Hanford Waste Tank Preliminary Dryness Evaluation*, WHC-SD-WM-TI-703, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

- Assesses the relative dryness between tanks.

Shelton, L. W., 1996, *Chemical and Radionuclide Inventory for Single- and Double-Shell Tanks*, (internal memorandum 74A20-96-30 to D. J. Washenfelder, February 28), Westinghouse Hanford Company, Richland, Washington.

- Contains a tank inventory estimate based on analytical information.

Van Vleet, R. J., 1993, *Radionuclide and Chemical Inventories*, WHC-SD-WM-TI-565, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

- Contains tank inventory information.

LMHC, 1998, Tank Characterization Data Base, Internet at http://twins.pnl.gov:8001/TCD/main.html.

- Contains analytical data for each of the 177 Hanford Site waste tanks.

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